

**ГРАММАТИЧЕСКИЕ
ТРУДНОСТИ
ПРИ ПЕРЕВОДЕ
АНГЛИЙСКОЙ
НАУЧНОЙ
ЛИТЕРАТУРЫ**



ИЗДАТЕЛЬСТВО «НАУКА»

АКАДЕМИЯ НАУК СССР
КАФЕДРА ИНОСТРАННЫХ ЯЗЫКОВ

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ИЗДАТЕЛЬСТВО «НАУКА»
Москва 1969

Работа представляет учебное пособие по переводу английской научной литературы и состоит из упражнений на грамматические трудности, характерные для научной литературы, и краткого грамматического справочника.

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ПРЕДИСЛОВИЕ

Настоящее пособие «Грамматические трудности при переводе английской научной литературы» представляет собой переработанное и значительно дополненное издание этой работы, вышедшей в 1963 г.

Предлагаемая работа состоит из двух частей. Первая из них — «Грамматические трудности при переводе английской научной литературы» и «Приложение I» составлены Е. С. Савиновой и Г. М. Улицкой; вторая — «Краткий грамматический справочник» — А. И. Черной.

В работу были внесены следующие изменения и дополнения:

1. Исключены сводные примеры после каждого раздела; вместо этого в конце всего раздела даны сводные примеры на все трудности перевода.

2. Введены разделы: «Некоторые случаи употребления глагола should» и «Некоторые случаи употребления глагола would».

3. В конце книги имеется приложение, содержащее выборочный контрольный перевод примеров из всех разделов пособия.

Первая часть — «Грамматические трудности при переводе английской научной литературы» — подразделяется на два раздела: первый раздел — примеры для перевода на английском языке, сгруппированные по отдельным грамматическим трудностям. Примеры подбирались из оригинальной научной литературы без адаптации или каких-либо

изменений, и с учетом типичной для научного языка и наиболее частотной лексики.

Использованы оригинальные тексты по следующим специальностям: физика, химия, биология, география, геология, астрономия, история, литературоведение и многие другие.

Примеры даются по принципу нарастания трудностей. По своей тематике они, в основном, расположены следующим образом: сначала даются предложения из области точных и технических наук, затем из области естественных наук и под конец из области гуманитарных.

В конце первой части дается общий раздел под названием — «Сводные примеры на все случаи трудностей». Предложения этого раздела содержат по две и больше трудности.

В сводных примерах последовательно повторяются все имеющиеся в пособии грамматические трудности.

Второй раздел — Приложение I — содержит перевод отдельных примеров из всех разделов трудностей. Он предназначен для того, чтобы показать, что имеется в виду под адекватным переводом и для проверки правильности перевода при самостоятельной работе над переводом.

Данное пособие следует использовать для повторения и закрепления основного курса грамматики, а также для работы над анализом и переводом текста научной литературы.

4. Внесены некоторые исправления в «Грамматический справочник». Данное пособие предназначено для использования в группах кандидатского семестра в системе АН СССР. Оно рассчитано главным образом на аспирантов и научных сотрудников, изучающих язык в этой системе, а также на аспирантов и студентов других учебных заведений или научных сотрудников, самостоятельно работающих над языком после прохождения полного курса грамматики.

Пособие удобно использовать в смешанных группах (состоящих из слушателей разных специальностей). В процессе работы преподаватели могут по своему усмотрению, независимо от порядка расположения, подбирать из пособия материал для иллюстрации, анализа и закрепления повторяемых грамматических явлений.

МАТЕРИАЛЫ ДЛЯ ПЕРЕВОДА

I. ПАССИВНАЯ КОНСТРУКЦИЯ

1. Magnetism is referred to in the oldest writings of man.
2. Many materials now commonly used were not even thought of thirty years ago.
3. Analysis is naturally followed by synthesis.
4. The positive particle in the nucleus of the atom was given the name of «proton».
5. The question now arises as to how the behaviour of metals is affected by the changes in temperature.
6. The qualitative examination of an organic compound is followed by a quantitative analysis.
7. The main reports were preceded by some introductory remarks.
8. A mechanical method was substituted for by an electric one.
9. The charge of an atom is not affected by the number of neutrons present but depends on the balance between electrons and protons.
10. The region surrounding a magnet, in which appreciable magnetic forces exist, is referred to as the magnetic field.
11. When the molecules of even a good insulator are acted upon by an electric field, there is a motion of electrons due to this field.
12. Chemical methods of purifying water are given much attention to by our scientists.
13. The use of metals is affected by the available ore resources, the cost of extraction and refining, and the way in which they can be employed to practical advantage.
14. It is not possible to obtain as high thermal efficiencies when furnaces are fired with raw coal as with other means of firing, but these matters will not be dealt with here.

15. Retardation may be looked upon as negative acceleration.
16. The extensive observations of Drew, Lipman and others have established that calcium carbonate precipitation is influenced by microbial activities.
17. When a concentrated clay suspension is allowed to settle, the clay will occupy a volume which is different from the original volume of the clay.
18. Atoms of zinc may be looked upon as composed by electrons and zinc ions.
19. The pole of a magnet which points North is referred to as the North Pole of the magnet, the other magnetic pole is the South Pole.
20. Almost all materials are affected to some extent when placed in a strong magnetic field.
21. The climate of Uganda is greatly influenced by the fact that the entire country lies 3600 ft above sea level and the heat is not therefore excessive.
22. Thinking of the universe as a whole, we are at once confronted by vital questions concerning its possible evolution in time.
23. In size Venus may be correctly referred to as the Earth's twin planet.
24. In many southern ports passengers are not allowed to land before being examined by a quarantine doctor.
25. Jordano Bruno could not be induced to change his mind by any means and so he was burnt.
26. It is known, as a matter of fact, that the Russian symbolists were strongly influenced by their French contemporaries.
27. In «The Sisters» (by Al. Tolstoy) we are shown Petersburg as it was, in its intellectual circles in 1914, on the eve of the war, and later.
28. Chekhov is admired in every country of the world and, above all, in the Soviet Union. He is almost universally regarded as the greatest Russian writer and as the greatest story teller and dramatist of modern times.
29. Russian poetry was greatly influenced by the popular verse in the eighteenth century and at the beginning of the nineteenth.
30. In the literature of classicism the common man was regarded as incapable of those higher passions that raise admiration and "tragic" compassion and could be appro-

- ached only as an object of amusement and ridicule.
31. Prometheus survives in the modern world as an ideal of unselfish conduct. He is thought of as a person who did not hesitate to endure great sufferings in an effort to benefit others.
 32. The idea of socialism arose and gripped men's minds in modern society because of discontent with the evils of capitalism, and the perception that only by a radical transformation of the entire economic basis could these evils be done away with.
 33. The most important waterway in France is the river Seine, which is canalized, and is adapted for boats carrying about 1000 tons as far as Paris, while below Rouen even larger ships can navigate.
 34. In practice the solidification of pure metals is influenced to a great extent by what may be generally described as external conditions.
 35. Cosmic rays in the range above 10^{18} ev have such large radii of curvature that they are but little affected by conditions in the solar system.
 36. The rise in bacterial numbers was followed by a sudden drop after the nutrients added to the water had been exhausted.
 37. The solubility of phosphate in sea water is largely a function of pH, a property which is influenced by bacterial activities.
 38. Little success was met with in attempting to remove the embryo from the yolk and flatten it under a cover glass as the tissue was too delicate and brittle.
 39. Conditions which affect the plastic behaviour of material will also influence its fracture behaviour since fracturing is normally preceded by plastic deformation.
 40. By now the phenomena of life are beginning to be seen more and more as problems which can be dealt with as scientifically as those of physics and chemistry.
 41. In the chapter on experimental techniques, we are given a good insight into many of the special problems that have to be solved.
 42. In gaseous reactions the equilibrium position is largely influenced by pressure.
 43. The range of application of gas chromatography is wide and most substances boiling under 300°C can be dealt with readily.

44. The increasing demand for oil can only be met by the application of the most efficient methods for its extraction and subsequent treatment.
45. The purity of an organic compound may be judged by the determination of various physical constants, such as the specific gravity, crystal form, or index of refraction.

II. КОСВЕННЫЙ ВОПРОС, ВВОДИМЫЙ СОЮЗАМИ WHETHER OR IF

1. In order to determine whether a given compound is organic it is frequently sufficient merely to heat it.
2. An electroscope can be used to tell if a body is charged positively or negatively.
3. Some elements possess so few metallic qualities that it is uncertain whether they should be called metals or nonmetals.
4. We shall now examine gases in the light of kinetic theory and see if any explanation of the exceptions to the gas laws can be found.
5. The question arises whether rocks are all natural combinations of mineral matter.
6. It is not known if insulin has any appreciable role in the temperature regulation.
7. Whether the nucleus is only a molecule rich in energy or a radical may be left an open question at this point.
8. Gases are such good insulators that, in the early days of science, argument arose as to whether they conduct electricity at all.
9. Whether autotrophic bacteria produce enough carbon to be of significance in the carbon economy of the sea is problematical.
10. Because chemistry is an experimental science, the correct procedure must be to see if the formulas do apply and then to classify the systems on the basis of their behaviour.
11. What are the criteria for determining if a text should or should not be classified as a programmed instruction?
12. Whether crude oil¹ could be formed in the absence of bacteria or whether bacteria play more than a minor role in the origin of oil is yet to be determined.

¹ crude oil — сырая, неочищенная нефть.

13. Every student in chemistry learns very quickly to use indicators, particularly litmus, in order to determine whether a solution is acid or basic in reaction.
14. Evidence at hand fails to prove conclusively whether the respiratory center has an inherent rhythmicity (Bernthal, 1944) and acts automatically as a result of its own metabolism.
15. The question arises whether there is any fundamental difference in the kinetics of reactions occurring in condensed media compared to the gaseous state.
16. It is necessary to know whether or not the molecules can still rotate freely in the crystal at the lowest temperatures at which its specific heats are measured.
17. With the discovery of positron, it became of interest to see if its specific charge was exactly that of the negative electron.
18. The causes of the fluctuations which have been described are not known, nor is it known whether these fluctuations are periodic in character.
19. It is a question whether we are to consider the dolmens¹ of the north of France as the work of one and the same people, or if we ought to attribute them to various peoples, different in race and living at different epochs.
20. Meditating about the hidden nature of things, the Greek philosopher Democritus came to the problem of the structure of matter and was faced with the question whether or not it can exist in infinitely small portions.

III. СОСЛАГАТЕЛЬНОЕ НАКЛОНЕНИЕ

Простые предложения

1. We should like to make some remarks about the higher order approximations.
2. It would be difficult to overestimate the importance of quantitative analysis to chemistry.
3. The easiest way to detect heavy hydrogen atoms would be by means of the spectroscope.
4. To summarize the findings of this tremendous work would require many pages.
5. Before entering upon a study of the logical design itself, we should like to say a few words about analogies and their proper and useful role in this field.

¹ Долмены — древние сооружения из крупных камней.

6. A knowledge of the kinetics of the various reactions would be of obvious value in attempting to arrive at an understanding of the complete combustion process.
7. A broad definition of the term «physical organic chemistry» might include a major fraction of existing chemical knowledge and theory.
8. Any quantitative measurement of the strength of the C_2 bands would be a considerable advance of our knowledge of this difficult problem.
9. The presentation of this lecture would not be complete without mentioning the nuclear particles known at present as «mesons».

Сложносочиненные предложения

1. I should like to begin with a general description of metabolism and then I shall turn to a discussion of the total biochemistry of small organisms such as bacteria and yeasts.
2. The total extent of the field of molecular spectra is large and it would not be possible, within the scope of the present book, to present more than a distinct sample.
3. All bodies must move through the ether, without appreciable friction, or the solar system would «run down» long ago.
4. There are a great many thermodynamic formulas, and it would be hopeless to find all of them.
5. Any chemist would be delighted to build even the simplest carbohydrate from carbon and water, but nature herself finds that impossible.
6. The term «solid solution» would at first seem to be contradiction but this is only because most of the familiar solutions are of liquid type and the term «solution» is to many people synonymous with «liquid».
7. To give an adequate yet brief account of the influence of the biological sciences in the twentieth century is a most difficult task and yet it would be essential to do it.
8. The subject of dielectric materials is indeed a broad topic and would require a complete volume for a detailed and thorough treatment.
9. Siberia is a land of such giant proportions as to tax the imagination; almost all of Europe or the United States together with Alaska could be placed within its borders.

Придаточные предложения подлежащие

1. It is necessary that the preliminary reaction be essentially complete.
2. To present the true structure of metals, it is essential that the samples be carefully prepared.
3. It is necessary that the plates of a condenser be well insulated from one another.
4. It is necessary that a machine undergo a thorough test before putting it into operation.
5. During frosty weather it is important that the water should be drained from pipes which are likely to freeze.
6. It is not necessary that there should be only one valence bond holding two carbon atoms together. There may be two or even three in some instances.
7. It is important that you should know the distinction between a star and a planet, not only by their appearances, but also by the great difference in their condition.
8. To get a perfect mirror, it is necessary that the tin exactly and evenly cover the glass.
9. It is desirable that all possible doubts and ambiguities concerning the structure of the DNA¹ molecule should be eliminated.
10. If the reaction involves more than one substance it is not necessary that they should all have the same initial concentration.
11. It is most desirable that some means should be provided for raising specimens of hard rocks in places where they are exposed on the ocean floor.
12. If the moving particle is to be equivalent to a wave group, it is necessary that the two shall not only traverse the same path, but that they shall traverse it at the same speed.

Придаточные предложения — предикативные члены

1. The main requirement of a precipitation method is that the polymer be insoluble in the monomer.
2. The regulation is that machine parts be subjected to X-ray examination to reveal all possible defects.

¹ DNA — дезоксирибонуклеиновая кислота.

3. The only requirement of controlling a locomotive is that it be made to go faster or slower.
4. The first requirement of a good system of classification is that it should be objective and reproducible.
5. In stating the value of e/m for an electron, the condition was that the velocity should not be high.
6. The requirement is that a special arrangement should be provided for protecting against the effects of lightning.
7. The main condition of the concept of a fundamental particle is that we should have also precise knowledge about their rest-mass, their spin, as well as the statistics they obey.
8. Two different oxidation states of the same element may be regarded as two substances. A necessary condition is that the substances should differ appreciably in the ease with which they are oxidized or reduced.
9. The primary requirement of a phase is that it shall be homogenous, and a system composed of only one phase is called a homogeneous system.
10. The most urgent task facing scientists today is that the peaceful employment of atomic energy should be advanced.

Дополнительные придаточные предложения

1. Newton suggested that light be interpreted as a stream of particles.
2. For thermal equilibrium, we do not demand that the energy be precisely determined. We demand rather that the temperature of all systems of the assembly be the same.
3. Roentgen suggested that the rays characterized by great penetrating power should be called X-rays.
4. The quantitative determination of ion or radical requires that precipitations be as complete as possible.
5. They insisted that there should be no underestimation of the tremendous significance of solar furnaces.
6. It was suggested that machine parts should be tested under very severe conditions.
7. One would like, however, that a given dose of 3-mev neutrons should produce nearly the same response as the same dose of 10-mev neutrons.

8. The Principle of Relativity requires that the law of conservation of energy should hold relative to every «Galilean» system of coordinates.
9. The very successes of physics and chemistry have ensured that biology should now present the key problems of the whole of natural science.
10. The Pauli exclusion principle requires that no more than two electrons should occupy a single orbit, and that the two electrons in the same orbit should have opposed spins, and thus should mutually neutralize their magnetic moments.
11. Belinsky regarded literature as a means not only of knowing life, but also of changing it, and insisted that the writer propagate progressive ideas.
12. Almost with his last breath Timiryazev asked that a message be conveyed to Lenin: «I consider myself fortunate to have been your contemporary and a witness of your glorious achievements».

Определительные придаточные предложения

1. Mendeleev estimated carefully the properties which the missing elements would possess when found.
2. The use of amplification makes possible the satisfactory reception of signals from waves that would otherwise be too weak to give an audible response.
3. One of the metals in which niobium would be a valuable alloying element is titanium.
4. We are assuming throughout this chapter that the primary condition that the system be stable is already satisfied.
5. For any rule that would be given, exceptions could be cited.
6. Punched-card machines can do some things which, due to their complexity, and the amount of labour involved, could hardly be undertaken otherwise.
7. A body of workers by harmonious cooperation is able to make advances that would be impossible for any single individual.
8. It was naturally desirable to devise methods by which one could produce strong beams of atomic projectiles¹

¹ projectile — снаряд.

simply by accelerating various charged particles (ions) in strong electric fields.

9. In astronomy it is customary to speak of very large distances by giving the time they could be covered by light that travels at the tremendous velocity of 300 000 km per sec.
10. An attempt has been made to present not only the basic theory and properties of various types of microwave spectrometers, but also some details of construction and specific operating characteristics which would be useful to the person faced with the problem of making and operating this type of instrument.
11. When Democritus and Empedocles spoke of atoms they were essentially basing their arguments on vague philosophical ideas concerning the impossibility of imagining a process in which matter could be divided into smaller and smaller pieces without ever arriving at an indivisible unit.
12. The current rises at once to the value it would have had in case the switch had been closed at some previous time.
13. A surprisingly large number of authors have written books on the economy of transport completely ignoring the assistance which the theory of today's transport might have given them.
14. There is a word that most of us use every day to designate that which could, and actually should, be considered as a fourth independent direction in the physical world. We are talking here of time, which together with space is constantly used to describe events taking place around us.
15. The use of polarized electrodes results in a much faster attainment of a steady potential, making possible some titrations that would be difficult to perform at zero current.
16. Nicholas Zhukovsky proved theoretically the possibility of building heavier-than-air machines which would not only be stable but would even be able to perform the loop and other aerobatics.

Обстоятельственные придаточные предложения цели

1. The instruments were packed carefully lest they should be broken during transportation.
2. In order that we may identify any particular organic compound, a systematic scheme of naming compounds has been devised.
3. It is not essential that the surface of the metal should reach its melting point in order that it may be polished.
4. While experimenting with inflammable substances one must take care lest the temperature should rise too high.
5. During the war the production of some civilian goods was discontinued in our country so that labour power and materials might be released for use in the war.
6. All components of water turbines should be designed so that cavitation shall be avoided.
7. Mendeleev found it necessary to alter some atomic weights in order that the elements should fall into positions in the periodic table assigned to them by their chemical properties.
8. Vohel's initial attempt to utilize nitroglycerine was to mix it with black powder in such a way that the mixture should remain dry and granular.
9. Railroad industry was to develop its services so that it might keep pace with the growing demands for carrying freight and passengers.

Условные придаточные предложения

1. If the magnetized steel ring be cut across at any point, the poles will be found there.
2. If two wires of the same material but having different dimensions be compared they will be found to possess different resistances.
3. If a single drop of water were magnified to the size of the earth, each molecule contained in it would be no larger than a football.
4. If the earth did not rotate it would not have the shape of a ball.
5. If we placed several kinds of matter on a hot stove, we should find that some would get hot sooner than others.

6. What would happen provided all the air could be forced out of the room?
7. The development of nuclear-powered aircraft would be far simpler if it were not for the great problem of radioactivity.
8. Were there no loss of energy by friction, the motion would continue once it had been started.
9. Kuznetsky Basin would not have been of such importance had there not been found coal there in ample quantities.
10. It is of some interest to see what spectra would have resulted if CH_3 (methyl radical) did not have a three-fold symmetry axis.
11. If any nuclear process could be persuaded to yield more than one effective neutron per neutron originally supplied, the reaction would proceed faster and faster.
12. If the temperature should fall below the boiling point the boiling will immediately cease.
13. Should the temperature of the filament increase, the magnitude of the electron flow will increase.
14. Should the limestone be heated in a covered crucible, a temperature of about 900°C is necessary to bring about the decomposition.
15. If we should add one or more electrons to the outer part of the atom, the atom would have a negative electrical charge.
16. Should the substance not solidify when cooled slightly below its melting point, the addition of a small particle of the solid will bring about solidification.
17. Should a rubber ball be immersed in liquid air and then taken out and thrown on the floor, it would fly to pieces like a ball of glass.
18. If a small lump of pure sugar should be placed in a glass of pure water, everyone would observe that a lump gradually becomes smaller and finally disappears entirely.
19. If you should climb the slopes of an erupting volcano, you would see the streams of liquid lava, ejected from the bowels of the earth, slowly turning solid, and you could say that you were witnessing the birth of stone.

**Придаточные предложения
образа действия и сравнения**

1. Because the metal in the centre is hotter than that near the walls of the furnace, it is in constant motion as if it were boiling.
2. Later developments in physics have shown that the electron cannot be accurately considered as if it were in orbital motion about the nucleus.
3. The whole weight of a body acts as though it were concentrated at a single point, this point being called the centre of gravity.
4. When an electromagnetic wave propagates through a uniform plasma it behaves as though the plasma were a homogeneous dielectric medium.
5. The real gas behaves as if it consisted of point molecules which do not attract each other, that is, as an ideal gas.
6. One can think of the atom as having been constructed stepwise, as if electrons were added one by one to fill each energy level.
7. In order to improve the sharpness of the image they take their microphotographs of bacteria in ultraviolet light, thus obtaining somewhat better results than they might otherwise.
8. H_2 burns fairly readily with NO_2 , but the flames appear to have a much lower temperature than would be expected for complete combustion.
9. French physicist Jean Perrin was able to confirm all the fundamental conclusions of the molecular theory of material structure, and the kinetic theory of heat, as decisively as if he had seen the molecules themselves with his own eyes.
10. Now Biology occupies a far more important place in our general life and thought than it did at the beginning of the century. At that time it seemed as if the very complex and fluid nature of living things precluded the study by the same rigorous methods as had been so successful in the physical sciences.

Уступительные придаточные предложения

1. The potential at many gold electrodes is scarcely altered, **be** the solution bubbled with air, hydrogen or nitrogen.
2. Although a great many different chemical reactions might occur simultaneously, we shall confine our attention to a single, isolated reaction.
3. No matter what material the cathode may be made of, electrons are always given off.
4. Whatever position the compass may be placed in, the deflection is found to depend on the relative positions of the wire and the compass.
5. It is possible to use a controlled electrode outside the tube although this kind of control might offer more difficulties than the internal grid.
6. Whatever disadvantages of the blast furnace may be, it is the most powerful unit reducing metal from natural iron ores.
7. Whatever the shape of the different parts of a vessel may be, the liquid it contains is always at the same level (except in capillary tubes).
8. Strange as it may seem, the theory of numbers, being the purest kind of mathematics, can be called, from a certain aspect, an empirical or even an experimental science.
9. The more commonly used procedure is to dissolve the sample, whether it be iron or a compound of iron in acid, in the ordinary manner and then convert the iron completely to the ferrous state by the use of some convenient reducing agent.
10. Before we go further with the discussion, and make the attempt to understand the all-important Law of Entropy, which rules the thermal behaviour of every material body, **be** it a tiny droplet of some liquid or the giant universe of stars, we have first to learn more about the ways in which the probability of different simple or complicated events can be calculated.
11. There is no one spot on the whole globe where there is not some rainfall, **be** it much or little; and the Sahara does have its rains.

Придаточные предложения причины

1. Oxygen is an element of utmost importance to us as all living things would die without it.
2. Perpetual motion would be contrary to the law of conservation of energy, for it would involve the creation of energy.
3. This oxidation reaction is not practicable without a catalyst as it would take place above 2000°C only.
4. Without naturally occurring polymers, man and his world could not exist, for the food we eat and the very sinews¹ of our bodies are polymers. Without man-made polymers our modern technology would be set back many decades.
5. It is easily understood why astronomers were keen to know the truth about light, for the observations on two stars might be entirely false if the transmission of light was not instantaneous.
6. Milk is always placed where no bad smells can get into it, for dirt and bad smells would soon make it go bad.
7. For technical reasons the circuitry associated with the counter was designed so that it should not record counting-rates in excess of 45 count-sec.

Общее повторение сослагательного наклонения

1. We should like to know what number expresses the rate of exchange, i. e., how much heat we obtain from a given amount of mechanical energy.
2. It would be a grave mistake to think that because of the irregularity of thermal motion it must remain outside the scope of any possible physical description.
3. It would be incorrect to say that X-rays became available to mankind as the result of accident.
4. What would be a high temperature in one context (for example, in the coking of coal) might be regarded as a very low temperature for the interior of a star.
5. Since oxygen plays such an important part in chemistry, we should like to stick to it as our standard, while keeping the weights of all other molecules above unity.

¹ sinews — **мышцы**.

6. I should like to remind the reader once again that polymer chemistry is a very large subject and one which is growing rapidly.
7. It would be a great mistake to believe that a living biologically homogeneous tissue can be compared with ordinary physically homogeneous substance.
8. It will be useful to consider how cell division is responsible for the reproductive processes in complex organisms formed by a large number of cells. Here we might be tempted to ask which came first — the chicken or the egg?
9. The elementary structural units of living matter are usually known as «cells»; they could also be called «biological atoms» (i. e. «indivisibles») in the sense that the biological properties of a given type of tissue will be retained only so long as it contains at least one individual cell.
10. The fact of instability of heavy nuclei throws light on the question as to why there are only ninety - two elements in nature; in fact any nucleus heavier than uranium could not exist for any period of time and would immediately break into much smaller fragments.
11. There is no telling whether the evolution of life on different «inhabitable» planets takes the same track as it did on our Earth. The study of life in different worlds would contribute essentially to our understanding of the evolutionary process.
12. In the future, when the price of titanium comes down to a level where it could compete with other metals, the most probable large applications for titanium would be in the transportation industry. This would include not only aircraft, but land and water transportation as well.
13. Scents, soap and lipstick have a pleasant smell thanks to aromatic substances derived from coal. The perfume industry would not be able to work without coal, nor would the pharmaceutical industry. Many medicines are obtained chemically from coal.
14. One can assume that the mechanism of energy transfer is the same in the liquid as in the gas. This would mean that cooperative action of molecules is not important.
15. The period from 1760 to 1830 is commonly known as the age of the Industrial Revolution; it might, with even

more appropriateness, as far as Britain is concerned be called the Canal Era.

16. The one precaution that should be considered is that radioactive gases be prevented from spreading through the air.
17. The purpose of any physics experiment is that a measurement should be made and the result expressed in terms of numbers, whether the measurement is the mass of a particle in grams, or a red-hot wire in degrees Centigrade.
18. The concept of a fundamental particle requires that we should have also precise knowledge about their rest-mass, their spin, as well as the statistics they obey.
19. Belinsky regarded literature as a means not only of knowing life, but also of changing it, and insisted that the writer propagate progressive ideas.
20. We are assuming throughout this chapter that the primary condition that the system be stable is already satisfied.
21. There are many properties that might be taken as criteria for the existence of ferromagnetism, but it would be difficult to make a definition that would be both useful and precise.
22. For unmanned planetary exploration the ideal guidance and control system would be one that could appreciate in environment and change its mode of operation to meet changing conditions.
23. In order that the inductance be independent of the current it is necessary that no magnetic materials be used in the coil construction.
24. The properties of plutonium make it obligatory that it be handled in closed, air-tight, and fireproof containers, which are kept at a slightly negative pressure against the surroundings.
25. The Soviet Union regarded the technical assistance given to democratic countries as a complex of measures designed to ensure that in future each recipient country might be able to develop its own research on the peaceful uses of atomic energy, independently of any other country.
26. It goes without saying that if a spark should fall into containers with inflammable liquids, quick and dangerous fires would result.

27. It is sometimes noticed that if a comparatively weak north pole be brought in the vicinity of a strong north pole, the attraction between the two poles results, rather than the repulsion which might be expected.
28. If a diamond were heated until it were red-hot and placed in a stream of oxygen, it would grow in size, turn into a chunk of coal and burn without leaving a residue.
29. Nearly all metals would rapidly oxidize completely, even at ordinary temperatures, if it were not for the fact that the products of oxidation cling to the metal and form a protective coating.
30. If you remember that the nuclear energy contained in one pound of uranium is equivalent to the energy content of ten tons of coal, you will understand that the possibility of liberating this energy would produce very important changes in our economy.
31. The kinetic energy possessed by falling water can be transformed into electricity. Were we to make a close study of such transformations, we should find that a definite quantity of energy of one kind always gives a definite equivalent quantity of another.
32. Men have long dreamed of being able to see each other though separated by hundreds of miles, and ever since the telephone was invented, the layman has felt that if scientists could find ways of sending sounds over long wires, they would eventually be able to send sights as well.
33. If there had been no earth's gravitation, the satellites would have moved through airless space in a straight line and at a uniform speed.
34. If Einstein had done no more than to find an alternative and neater expression for gravitation than Newton, he would have been the Copernicus of the new era; but he did more, he showed that the new method gave results in better agreement with experiment.
35. If it were clearly understood by the peoples that the use of thermonuclear weapons in war might put an end to the human race, there might well be no risk of war.
36. «As blind as a bat» is the saying, but if bats could speak they might more truly say: «as blind as a man», because men cannot see in the dark.
37. It was assumed that the gas law equation would hold accurately if it were not for such disturbing factors as

molecular attractions and the unfortunate fact that molecules occupy space.

38. The problem we have set up in the previous paragraph is indeed formidable and if it could be solved, we could presumably predict the crystal structure of any solid.
39. There are many different ways of estimating the size of atoms and molecules, and the simplest of them is so simple that Democritus and Empedocles working without modern laboratory equipment could probably have used it had they happened to think about it.
40. Sometimes we specify distances by giving the time necessary to cover them using a given type of transportation. Thus, if we could agree on some standard velocity, we should be able to express time intervals in units of length, or vice versa.
41. The binary system is peculiarly appropriate to the nature of an electric machine; if it had not existed, computer designers would have had to invent it.
42. The light which vanishes in the dark regions appears in the bright with the result that the bright bands are more intense than they would be if uniform illumination prevailed.
43. Had it not been for the futile attempts of the early chemists to turn iron or copper into gold or silver we might never have learned that metals are elementary chemical substances and that metal-bearing ores are composites formed by a combination of the atoms of metals and oxygen.
44. If an attempt were made to use a brittle substance such as glass in the structure of a bridge, it would fail and fall into the river when it became unevenly loaded.
45. The only difficulty of the Chinese spoken language, of no matter what dialect, lies in the «tones» (different intonations of one and the same sound which produce different meanings). But for these tones, the colloquial of China would be very easy.
46. Were we to judge Tizian's work solely by photographs, we should wonder how the grand old man of Venice ever got his reputation.
47. We all know what space is, although we should find ourselves in a rather awkward position if we were asked to define exactly what we mean by the word. We should probably say that space is that which surrounds us,

- and through which we can move forward or backward, right or left, up or down.
48. In Indian Seas, native divers would swim down into the green depths for pearls and sponges. But skilful though they were, they could not remain under water much longer than three minutes at a time.
 49. Using the method of analogy, we can answer many questions concerning the properties of fourdimensional figures although try as we may, we shall never be able to «imagine» a fourth independent direction in our physical space.
 50. The bee is an insect. This means that its body looks as if it were cut out through in two pieces. The word «insect» means «cut into».
 51. Stories went round of Leonardo Da Vince's exeptional strength; how he could bend a horseshoe as if it were a coil of lead.
 52. It is not uncommon to hear people talking of the Chinese language as if it were a single tongue spoken all over China after a more or less uniform standard. But the fact is that the colloquial is broken up into at least eight dialects each so strongly marked as to constitute eight languages, as different to the ear, one from another, as English, Dutch and German.
 53. Biology now touches the physical sciences at so many points that it would be difficult for anyone who has worked in the latter not to have had some practical contacts with biological topics.
 54. Power could be transmitted over several miles by a series of belts, but the loss due to friction and other causes would be so great that only a small proportion of the power would remain to be used.
 55. Just as we find the most basic elements in the first group, so we would expect to find the most acid elements in the last group of the periodic system, and such is the case.
 56. Generally speaking we may say that the Florentine painters, being primarily involved in problems of mass and structure, modelled their forms in monochrome and added colour as a decorative accessory, as one would gild a statue or brighten a piece of architecture.
 57. Without adequate acquaintance with classical myths

one could neither enjoy art galleries nor see the reason for certain paintings. Moreover, unless he knew something of these myths, he could not fully appreciate the decorative designs on the outside of many buildings, or in all cases understand the statuary which he sees in elaborate gardens or parks.

58. The needs of ancient accounting did not exceed the number of a few thousands, the symbols for higher decimal units were nonexistent, and an ancient Roman, no matter how well trained in arithmetic, would have been extremely embarrassed if he had been asked to write one million. The best he could have done to comply with the request, would have been to write one thousand M's in succession, which would have taken many hours of hard work.

IV. НЕКОТОРЫЕ СЛУЧАИ УПОТРЕБЛЕНИЯ ГЛАГОЛА SHOULD¹

Should в значении долженствования

1. A study of current economic problems gives us some idea of what we should expect in future.
2. The concentration of the soil solution should be approximately inversely proportional to the moisture content of the soil.
3. It is evident that further developments in machine technology should take account of the existence of programmes of the type of APACHE 2.
4. We have used the words *electron* and *beta-particle* interchangeably, but perhaps some justification should be given.
5. The mixture of two substances should stand as short a time as possible and should not be exposed to light or there will be immediate decomposition of one of the substances.
6. The basic idea of Dirac's theory can be formulated in these simple words: «There should be holes in empty space».

¹ Ввиду того, что в научной литературе should редко употребляется в качестве вспомогательного глагола при согласовании времен, примеры подобного употребления не приводятся.

7. No substance should be considered completely insoluble.
8. Mass spectral data should be useful in yielding information about the amount of excess electronic energy imparted to the ions.
9. The general rule of submitting manuscripts is as follows: manuscripts should, preferably, be in the English language. Pages should be consecutively numbered. Inserts should be gummed on to the proper page and the point of insertion clearly indicated. Tabular matter should be kept down to a minimum, and whenever possible tables should be drawn in black India ink.
10. While translating technical texts recourse should be had to special dictionaries.
11. The difference between the revolution and rotation should be carefully noticed, because astronomers use the words to denote two distinct movements.
12. The specification of structure of plasma should include a description of the spatial and temporal variations of the electric and magnetic fields and current densities, as well as the ranges of parameters for which these configurations exist.
13. Belinsky advanced the idea that literature and art should serve society and he demanded of the writer and artist lofty ideas, simplicity and a truthful portrayal of reality.
14. Mayakovsky's attempt to suggest in advance the rhythm his poems should be recited with is easily understood.

**Should в качестве вспомогательного глагола для
образования аналитической формы сослагательного
наклонения**

1. In conclusion, I should like to remind the reader once again that the «Notes from Underground» is an introduction to Dostoevsky's great novels; in the «Notes» Dostoevsky elaborated his philosophy for «Crime and Punishment».
2. In order to approach predicted theoretical thermodynamic performance, it is necessary that the reaction should be completed within the combustion chamber.
3. A statistical theory of thermodynamic phenomena requires that the various particles of the system should be in a slight mutual interaction.

4. It is recommended to all designers of low temperature equipment that every advantage should be taken of the desirable properties of helium.
5. The very successes of physics and chemistry have ensured that biology should now present the key problems of the whole of natural science.
6. If the reaction involves more than one substance it is not necessary that they should all have the same initial concentration.
7. On a small scale, the distribution of molecules in the air is far from being uniform. If we could use sufficient magnification, we should notice the small concentration of molecules being instantaneously formed at various paths of the gas, only to be dissolved again, and be replaced by other similar concentrations appearing at other points.
8. In his testament written in verse Shevchenko expressed the wish that his remains should be interred in his native land.
9. Should there be no rain crops will be spoiled.
10. Should the lubricant supply stop, even momentarily, serious damage might result.
11. Should the pump fluid be contaminated, the circulating oil will release vapours into the vacuum system.
12. Should we pour slowly a quantity of lime-water over a pile of sand, it is obvious that the carbonate of lime would be formed in the interstices between the particles, and might finally fill them up.

Эмоциональное употребление should

1. It is but natural that collisions between atoms should be frequent and that they are of great importance in many phenomena.
2. Since water contains hydrogen and is too abundant and inexpensive, it is but natural that we should try to obtain an element from this source.
3. In igneous rocks copper is less abundant than rubidium zirconium and other so-called scarce elements. It is surprising therefore that it should be sufficiently abundant in the sea to be deretminable.

4. It is doubtful that the distribution of some species of marine life should actually be restricted to some narrow areas.
5. It is somewhat surprising that a shell structure should exist in heavy nuclei because the interaction between neighbouring nuclear particles should be very strong indeed.
6. Since North America is the second widest land in northern latitudes it is but natural that it should exhibit ranges of temperature second only to those of Asia.
7. It is no wonder that such figure as Leonardo should have passed so swiftly into legend.
8. It may seem strange that the interplanetary debris that happen to land on the earth should be accorded such importance in discussions of its chemical nature, but some features of meteorites indicate a close genetic relationship with the solar system.
9. There is no particular reason why oil should have been formed at one period of geologic history rather than another.
10. Since the atom, with its system of electrons rotating around the central nucleus resembles closely the planetary system, it is but natural to expect that it should be subject to the same well-established astronomical laws that govern the motion of planets around the sun.
11. We do not know why some lymphocytes should enter the blood, directly, while others pass into the lymph channels and so enter the blood indirectly.
12. We do not know why there should have been this relatively late formation of lymphoid tissue in the two main groups of warm blooded vertebrates.

V. НЕКОТОРЫЕ СЛУЧАИ УПОТРЕБЛЕНИЯ ГЛАГОЛА WOULD

Would для выражения повторного действия

1. Automatic devices would automatically determine the location and magnitude of an error, correct the result, and allow the computation to proceed without interruption.
2. Cheese would not keep long without salt.

3. The apparatus was examined several times and it would always prove quite exact.
4. As the plant is a living thing it must have food, or it would die.
5. The most convincing evidence of the existence of atoms and molecules would lie in the tiny units themselves.
6. Most of the iron isotopes have zero nuclear spin and would not show any hyperfine structure.
7. A cyclic device which would continuously abstract heat from a single reservoir and convert the heat completely to mechanical work is called a perpetual motion machine of the second kind.
8. It must not be forgotten, however, that whereas most chemical reactions would take place easily at temperatures of a few hundred degrees, corresponding nuclear transformations would not even start before the temperature reaches many millions of degrees.
9. It is possible, however, to devise more elaborate automatic devices which would correct a number of errors occurring simultaneously in the same operation.
10. Some people would pass by common things without notice.
11. In Indian seas, native divers would swim down into the green depths for pearls and sponges. But skilful though they were, they could not remain under water much longer than three minutes at a time.
12. Grass wants some moisture in the soil. Good grass would not grow in dry soil. But no grass of any kind would grow in the wet swampy land.
13. The year 1831 found Shevchenko in St. Petersburg, the servant of a landowner by the name Engelhardt. The young serf was passionately interested in art and during the long «white nights» of St. Petersburg he would steel off to the Summer garden and there sketch the statues that graced the park.

**Would в качестве вспомогательного глагола
для образования аналитической формы сослагательного
наклонения**

1. Without the sun this world would be a very cold, dark, dreary place. Nothing could grow. No creature could live in it. It would be a dead world.
2. In principle, much more complete information about the nature of a material can be obtained from single crystal specimens. This alone would be sufficient to explain why modern research is making more and more use of single crystals.
3. Imagine that we could cut a tiny cubic «box» out of air and hold it in our hands as we would a block of wood. What physical properties would it exhibit. First, it would have weight and, hence mass.
4. Ideally, one would wish to determine directly the concentration of hydrogen atoms during the course of a reaction.
5. It would be expected that the Antarctic convergence would move northward as the speed of surface currents increases.
6. Many substances which would be expected to be amorphous are really cristalline in substance.
7. Although the method is apparently not very accurate it may be used in cases such as the present which would be otherwise insoluble.
8. As would be expected from its smaller mass, the range of an electron of given energy is much larger than for the heavy particles.
9. If the vapours emitted were collected, they would be found to consist largely of water.
10. What would happen if all the air could be forced out of the room?
11. Would it be always dark and cold, if we had no sun at all in the sky?
12. If the upward slope were due to the distribution of mass in the ocean the average density of the Gulf Stream water of the continental shelf would have to decrease in the direction of flow and the Gulf Stream would have to flow uphill.

13. Had the whole Hindusthan risen simultancously on the 31 st of May, history would not have had to wait longer than 1857 to record the distruction of the English empire and the victorious Independence of India.

**Would — в качестве вспомогательного глагола
для образования Future in the Past**

1. During the earlier phases of the study of molecular vibrations it seemed highly unikely that a detailed knowled-ge of the vibration spectra of really complex molecules would ever be achieved.
2. The intention of the present work was to see whether a detailed study of a range of alloys would reveal any regularities of behaviour.
3. The problem was raised as to whether the deep waters of the Pacific would provide a longer period of isolation for radioactive wastes than elsewhere. Thus deep paci-fic oceanographic data must be carefully scrutinized.
4. It was in the course of a systematic attempts to see if any radiation would be produced which would traverse mat-ter opaque to ordinary light that Roentgen discovered the X-rays.
5. Dostoevsky was an ardent patriot. He was firmly confi-dent that the Slavonic peoples would play a major role in history.

VI. НЕЛИЧНЫЕ ФОРМЫ ГЛАГОЛА

И н ф и н и т и в

Инфинитив в функции определения

1. The condenser is a device to store electric charges.
2. Amber, glass and sealing-wax are among the substances to be easily electrified by rubbing.
3. There are many considerations to be taken into account in determining space velocity.
4. Boyle was the first to have a clear concept of «element», «compound» and «mixture».
5. The problem to be solved at this stage is an entirely geometric one.

6. The process to be treated subsequently in more detail is known as ionization.
7. There are many methods available for the measurement of magnetic susceptibility. The choice of a method depends on the problem to be solved.
8. The constant search for materials to replace or supplement scarce metals encourages more attention to this new field.
9. The general problem to be solved is to find the current-density distribution across the radius as a function of time.
10. The earliest of the compound radicals to be determined was the ammonium radical, investigated in 1808 both by Davy and by Berzelius.
11. The first mathematician to consider the nature of the resistance of solids to rupture was Galilei.
12. D. I. Mendeleev, a famous Russian chemist, was the first to discover the law of dependence of the properties of elements upon their atomic weights.
13. An important consideration to bear in mind is that in many structures two or more different types of bonds may operate simultaneously between different atoms.
14. The first feature to be noticed in the map of the annual temperatures is that nearly all of Canada but the southern margin has average temperatures below freezing point.
15. The value of the resistance to be used will depend on the amount of plate current that passes through the rectifier.
16. There is quite a difference of opinion as to the most practicable space velocity. There are many considerations to be taken into account in determining space velocity.
17. The dwarf birches ¹ to be found in the northern parts of our country are extremely frost-resistant.
18. Teodoros was the first Ethiopian sovereign to realize the technical inadequacy of his country in comparison with the European nations.
19. The Soviet Union is the first socialist state to consider all nations equal.

¹ dwarf birch — карликовая береза

20. Bacon was the first to emphasize the importance of experiment as the only reliable source of facts concerning natural phenomena.
21. The first of the British overseas territories to be given a selfgovernment, Canada, is now also the most highly developed.
22. For convenience, the reactions to be considered have been arbitrary grouped into four categories.
23. Lomonosow was the first to lay the foundation for the scientific study of the Russian language.
24. Panayev's novels were full of high-sounding sentiments and melodramatic situations lacking the sense of reality to be found even in Gogol's most fantastic stories.
25. Mallarmé, while providing many examples of verbal harmony in his own work, is the first to draw attention to symphonic form as the best expression of the thought in music.

Оборот «именительный падеж с инфинитивом»

1. Objects are said to be warm, hot, cool, or cold compared with the temperature of the human body.
2. The nuclei of all atoms are known to be made up of protons and neutrons.
3. Water was considered to be an element.
4. Minerals forming solid solutions are said to be isomorphous.
5. The atmosphere has been proved to extend several hundred kilometers above the earth.
6. A line is said to be normal to another when it meets the other at right angles.
7. Electricity supplied by a solar power station is likely to be much cheaper than that produced by burning coal or oil.
8. The diameter of the sun is assumed to equal about 1,391,000 km, thus, it is thousands of times larger than the earth.
9. During the first few years following the second world war the electron diffraction method seemed to get into a crisis.
10. No material is considered to be perfectly elastic even at very low stress.

11. The earliest devices for comparing temperatures are known to make use of the change in volume of a confined fluid as it is being warmed.
12. To an ordinary observer the air seems to have no weight and to offer little resistance to bodies moving through it.
13. As brought about previously, the proteins are thought to be largely made up of long polypeptide chains.
14. There are crystals in which there appears to be two types of interatomic attraction acting at the same time.
15. Mathematically two coordinates locate a point known to lie in a given plane, as the xy plane.
16. The combustion process in the torch is considered to occur in three stages.
17. Metallic aluminium seems not to be acted upon by air or water or many other chemical agencies.
18. The inclusions of magnetite form only a small fraction of the cosmic dust known to fall on the earth.
19. The question whether the atom can or cannot be split up is known to have interested scientists from ancient times.
20. The rates of a great many chemical reactions are found to be influenced by solid surfaces.
21. The reproductive rate of little plants grown in cultural solutions was seen to fall off as the phosphates and nitrates were depleted and finally growth would stop altogether when they were entirely used up.
22. The gas, formerly called «Active nitrogen», has recently been shown to contain in important amounts only nitrogen molecules and nitrogen atoms.
23. Flames may prove to be convenient laboratory sources for examining the basic processes of electronic excitation.
24. Bacteria are popularly supposed to divide only by binary fission. Many of the common organisms do in fact divide in this way.
25. The only velocity known in physics to possess the desired degree of generality is the velocity of light spreading through empty space.
26. Cellulose is a typical fibre structure, and its widespread occurrence in the plant kingdom, where it has been estimated to comprise about one-third of all vegetable matter, gives it a special importance.

27. Aromatization proved to have been produced by access of air to the reaction mixture.
28. Deep-sea bacteria have proved to be even more sensitive to heat than those from shoal waters.
29. In most applications the load imposed on a generator is likely to vary during a heating cycle.
30. A point of importance is considered to be the location of the sensing element in the gas.
31. The same order of monomer reactivity cannot be expected to obtain for different radicals.
32. Most of the bacteria recovered from marine bottom deposits prove to be anaerobes.
33. Because of the two outstanding characteristics, availability and workability, magnesium is now considered to be destined to become one of the world's common structural metals.
34. According to modern views, a metal is considered to consist mainly of metal ions and free electrons of high mobility.
35. From the steel-maker's point of view the Bessemer process is considered to have certain operating advantages over the other methods.
36. The findings appearing to belong to the same period are of considerable interest to archeologists.
37. At the time the phenomenon of radioactivity was discovered the chemical elements were regarded as unalterable; they were thought to retain their identities throughout all chemical and physical processes.
38. The name «rugular solutions» was introduced by Hildebrand (1929) to describe mixtures whose excess entropy was found experimentally to be zero.
39. Electricity supplied by a solar power station is likely to be much cheaper than that produced by burning coal or oil.
40. It was once generally thought that life could not exist at great depths because of the adverse living conditions believed to prevail in very deep water.
41. Sediment samples taken from the bottom of the Philippine Trench at depths exceeding 10 000 meters were found to contain from 10^4 to 10^6 living bacteria per ml.
42. The benzene formed does not appear to have been quantitatively estimated.
43. Of all of the different types of atomic aggregates, io-

nic crystals have been found to be most suited to simple theoretical treatment.

44. Metals known to exist in more than one crystallographic forms are cobalt, cerium, tin, manganese, chromium, thallium.
45. The earth is believed to have formed from the same material that gave rise to the sun and the other planets.
46. A sudden large supersaturation of the solution proves to cause the precipitation of very fine crystals.
47. Computers do not seem to be able to use their memories in the way that Archimedes and Newton are reputed to have used theirs at the moments of creative insight.
48. As might be expected, absorption of light will be found to vary considerably according to the amount of suspended matter, either sediment or plankton, in the water.
49. It is reasonable to expect and it has been found in practice, that an automatic computer is much less likely to make mistakes than a human being doing the same work.
50. Up to 1928 organic compounds were believed to be the products of vital processes only, that is the products of plant or animal organs, therefore «organic».
51. We see from Figure 2 that magnitude is an even function of frequency and phase is an odd function of frequency, which always turns out to be the case.
52. Solar installations have been reported to exist in many countries. Some of these installations seem to be used primarily for experimental purposes.
53. The theory of gradient-Doppler has been demonstrated to have wide application and it is founded on already well accepted principles.
54. Bohr's theory of atomic structure turned out to be extremely fruitful in the explanation of various properties of atoms and molecules.
55. The present era, which is distinguished by the utilization of metals in enormous quantities, may be said to have begun in 1860.
56. The steam turbine, in a crude form, is said to have been used many centuries ago, but its development as a really practical form of prime mover has only taken place during the last fifty years.

57. The majority of Guerick's experiments on air pressure appear to have been carried out between 1657 and 1662.
58. Guerick appears to have been working on the air pump in 1635 onwards.
59. The zero of the galvanometer cannot be relied on to be entirely stable while the instrument is run into the bottom of the sea.
60. The islands of Hawaii are still thought, by geomorphic and other evidence to have been above water during the Tertiary, probably Late Tertiary and Pleistocene.
61. A brittle solid is considered to contain a number of minute cracks which act as local stress concentrators and give stresses of sufficient magnitude to cause failure.
62. The word «radar» means Radio Determination and Ranging. The birth of Radar is known to have taken place almost simultaneously in quite different countries.
63. During an 11-year sun spot Cycle the Galactic cosmic-ray flux at the earth has been observed to vary by more than a factor of two at the lowest energies that can be studied by balloon flights near the geomagnetic pole.
64. Together with radiolarian ooze ¹ red clay occurs over the deeper parts of the sea floor and so might be expected to contain less organic material.
65. Most of the areas covered by red clay underlie the great central eddies of the oceans, which, as we have seen earlier, seem to be less productive of plant life.
66. The scientists found that many species known to be drawn from the Atlantic deep-sea floor also occurred in the Mediterranean, but it seemed that the thick grey muds of this sea did not carry such an abundant fauna as the Atlantic.
67. Experimental physics prior to 1900 had demonstrated the existence of a wide variety of phenomena, which for the most part were believed to be explicable in terms of what we now call classical theoretical physics.
68. The unravelling of the complicated problem of the nature of the sterols is one of the outstanding achievements of modern organic chemistry and one which has proved to be of the utmost importance to the progress of investigations in several related fields.
69. Since coals occur in every geological age since De-

¹ radiolarian ooze — радиолярный ил.

- vonian times, their distribution would seem to be some slight indication that the humid portions of the earth have not radically altered in the last 250 million years.
70. Comparatively few of the elements prove to occur as uncombined substances in nature, most of them being found in the form of chemical compounds.
 71. Cosmic rays have been shown to be a form of radiation similar in nature to those of radio and light and differing from them only in wavelength and penetrating property.
 72. The complete elucidation of a reaction mechanism might be expected to include a stereochemically complete description of the movements of every atom throughout the reaction.
 73. Many proposals for changing the traditional methods of storing and searching for information have been made in the last decade, and some of these have already proved to be of considerable practical value.
 74. There seems to be almost universal agreement that the traditional methods of storing and searching for information are not efficient enough at the present time and will become less so in the future.
 75. The Zero of the galvanometer cannot be relied on to be entirely stable while the instrument is run into the bottom of the sea.
 76. In the case of feeble magnets the magnetic field is so weak that it may be considered confined to a small region near the magnet.
 77. Crude oil or petroleum, which consists largely of gaseous, liquid, and solid hydrocarbons, is believed to be formed in shallow seas where the rate of sedimentation is rapid, and organic productivity is high.
 78. Broun et. al. (1955) found that many magnetic particles from the floor of the Pacific Ocean consisted of a siliceous groundmass with inclusions of magnetite. These were thought to be of cosmic origin, from trails of stony meteorites. However, they form only a small fraction of the cosmic dust known to fall on the earth.
 79. Coal is generally considered to have been formed in the earth by prolonged action of geological forces and favourable biochemical conditions on accumulation of vegetable matter under water.
 80. For a very long time electricity was considered to be

an unknown mysterious phenomenon that interested the philosophers and scientists or amused the public at large.

81. No way of producing cosmic rays artificially has yet been discovered; indeed, as they represent an energy pressure of thousands of millions of volts, they are not as yet likely to be generated electrically upon the earth.
82. For two thousand years the basic laws of geometry offered by Greek scientist Euclid were considered to be indisputable.
83. The activity of Vesuvius is believed to date only from the end of the pliocene period.
84. Some of the ancients held that matter was composed of atoms. Still they can hardly be said to have formulated a true scientific theory.
85. The number of stars which is within the range of the naked eye is believed to be about 6000.
86. The period of the highest civilization of ancient Egypt seems to have been that of the Middle Empire.
87. India appears to have been acquainted with iron and steel from an early age.
88. Football is believed to be the oldest outdoor game in existence. Its history may be traced back century after century until the trail is lost in antiquity.
89. The Egyptians in nearly all periods of their history seem to have been very fond of making written records, or of constructing permanent monuments of some kind which would preserve their memory to aftertimes.
90. Almost from the moment the Republic of India began its existence as a sovereign and independent state, there appeared to be basic differences between its foreign policies and those of the U. S. A.
91. Even the most primitive tribes are found to have well developed languages based on the formulation of concepts which may not always fit readily into conceptual framework with which we are familiar in our own language and which characterizes other languages of the Indo-European group.
92. The confidence the Russian people displayed in the Soviet Government proved to be the decisive factor which ensured our historic victory over the enemy of mankind, over fascism.

93. Suworov vigorously condemned the principles of the Prussian militarists, at that time considered to be the last word in the science of warfare.
94. Accentual verse has long been familiar in popular poetry in Russia. This is not surprising: such poetry is meant to be sung and its stresses are in fact musical stresses.
95. Russian folk-poetry was meant to be sung and it remained unwritten until in the eighteenth century a number of lovers of folk-lore took it into their heads to write down some specimens of it.
96. In England as well as in France Turgenev was judged to be the most modest and sincere of individuals.
97. The genre of detective fiction does not appear to have taken strong root in Russian literature and had produced no Russian classics of its kind.

Оборот «объектный падеж с инфинитивом»

1. The ancients thought the Earth to be flat.
2. Some scientists consider Mars to be covered with vegetation.
3. As in liquids, the atmospheric pressure at any given point is equal in all directions but we know it to decrease as altitude increases.
4. On close examination of a piece of granite we find it to be composed of several kinds of minerals having different degrees of hardness, different colours, and different properties in general.
5. We know the first central electric power-stations to have been built for the supply of electric light.
6. Using more rigorous reaction conditions, Doern found the ethyl derivative to yield alcohol.
7. Design features of the device allowed the specimen to be heated in vacuum.
8. The magnetic field controls the movement of the particles, making them travel along a single track.
9. We know the velocity of a particle to be continuously changing if this particle has a nonuniform motion: in each successive time interval the particle acquires some increment of velocity.
10. The success of Germanium and silicon has caused research to be directed towards finding other materials.

11. Different purposes and circumstances will require us to apply different procedures and devices if we are to achieve the greatest possible benefit.
12. Different gases might cause the currents to differ by altering the surface of the metal either by combining with it or by condensing on its surface.
13. The Pauli exclusion principle requires the two electrons occupying the orbital «a» to have opposite spins, or, in other words, to be paired with each other.
14. The semiconductor diode allows current to flow through it freely in one direction but restricts the flow of current in the opposite direction.
15. We might synthesize water by allowing hydrogen and oxygen to combine, which they do very readily.
16. X-rays have been of tremendous assistance to the engineer in enabling him to work by knowledge instead of by rule of thumb.
17. This electronic microscope enables events lasting several msec to be recorded at magnifications up to 500.
18. The particular aspect of the Theory of Relativity which enables us to reach a consistent conclusion is the transformation of time.
19. During his lifetime Roentgen had the satisfaction of seeing his discovery become a major diagnostic aid in the field of medicine.
20. At first sight most ores do not seem to differ much from ordinary rocks so it is not surprising that ancient scientists believed ores to be made of the same stone-stuff as any other rock.
21. If one stood on the shore and saw a ship go out one would say that the funnel was moving, and yet a person on the ship would say that it was stationary.
22. We would expect an orderly succession of minerals to be present in all the veins related to the consolidation of any particular magmatic body.
23. There are several kinds of bats in Britain, but if we could examine any of them closely, we should find it to have much the same shape and colour as a small mouse.
24. The ancients, except for a few rare individuals with greater insight conceived the world to be an enclosure.
25. Toward the end of the last century the Russian chemist D. Mendeleev noticed a remarkable periodicity in the chemical properties of elements in a natural sequence. He

found the properties of the elements to repeat themselves after a definite number of steps.

26. Chekhov soon discovered that it was impossible to make the reader draw the right moral from his stories.
27. Chekhov had acknowledged himself to be a realist pure and simple and had taken for his watchword the phrase «life as it is».

Оборот «for + существительное + инфинитив»

1. What we want is for you to understand the matter clearly.
2. For a system to be correct it must only use well-established components.
3. It is impossible for a single force to produce the same effect as a couple.
4. The time required for the mass to come to rest can be calculated without difficulty.
5. There is a tendency for corrosion to enter the metal along the surfaces of sliding.
6. It is noteworthy that the hydrogen bond makes it possible for electrons to travel in a circular path.
7. The requirement for cobalt alloys to be used for high temperature service and permanent magnets has created an acute demand for cobalt.
8. It is possible for elements to combine in different proportions, but when they do so different substances are produced.
9. Wherever motion exists friction is always acting in a sense opposed to the motion, although in many cases its very presence is essential for the motion to take place.
10. The tendency will always be for reactions to continue until the relationship between the concentrations of the various substances concerned satisfies the conditions demanded by the equilibrium constant.
11. In order for any phenomenon to be shown visually as a function of time it is necessary that it be electrical in nature.
12. In many tables the factor of safety rather than the allowable stresses will be given, thus making it easier for the designer to make his own choice of material.

13. Some experiments prove that it is physically possible for the ground ice of Alaska to have been formed by a process of segregation.
14. The time necessary for the sun to move a complete circle around the galactic center is some 200 million years.
15. The radio frequency has to be chosen such that its period equals the time it takes for the ions to make one revolution.
16. A special device is attached to the upper end for the frame to move smoothly.
17. There are times when the soil is too cold or dry for root elongation to occur.
18. For the rule to hold rigorously, it would be necessary for all covalent bonds to have the same bond energy.
19. Although deaerated fresh water absorbs oxygen more rapidly than sea water, it required the same time for either to attain the same percentage saturation.
20. A number of conditions must be fulfilled simultaneously for electron transfer to take place, and, for different systems, different factors dominate in controlling the rates.
21. When a high velocity missile strikes a target, it is usual for both the missile and the target to deform plastically as a result of the impact.
22. For a consistent quantum theory it is necessary for a light beam to satisfy the same uncertainty relation as a particle.
23. The object of the teaching machine is for the computer to teach effectively within its conventional and logical limitations.
24. The radio frequency has to be chosen such that its period equals the time it takes for the ions to make one revolution.
25. Hydrogen has a strong tendency to combine with oxygen. This tendency is sufficiently strong for hydrogen to take oxygen away from metallic oxides, which process is called reduction.
26. According to the quantum theory, radiative energy is always collected into certain discrete portions, known as «light-quanta» and in order to see an object it is necessary for at least one light-quantum to be reflected from its surface.

27. Our age is often called the age of specialization. It might be more aptly called the age of ultra-specialization, for it is no longer sufficient for the scientist to specialize in one science, such as geology, metallurgy, chemistry, and so on. Even within this limited sphere of technical knowledge he must choose a narrow path if he is to reach its limit.
28. There seems to be an irreversibility in all natural processes, a universal tendency for energy to degenerate into other forms less available for transformation.
29. In order for a solid propellant to burn it is necessary that somewhere in the flame zone the solid be transformed into a gas by chemical reaction, in a manner presumably governed by the arrhenius equation.
30. For any reaction to occur it means that the final state of the system must have a lower free energy than the initial state, and if this condition is satisfied there must be some tendency for the change to take place.
31. Automobiles have mirrors for the chauffeur to see what is going on behind him.
32. The new freedom of Asia is too recently won, and at too great a cost, for the Asians not to treasure it.
33. It is characteristic of beginning scientists to fear that the most important discoveries have all been made in the past, and that the most usefull devices have already been invented, leaving only lesser problems for further ingenuity to solve.
34. Lomonosov proposed the idea of opening a route from Russia to America via the Arctic. It remained for Soviet men to realize his dream of connecting the two continents by air via the North Pole.
35. Through keener insight of an intellectually minded man made it impossible for him to accept the myths literally, he did not wish to discard them entirely, but chose rather to look upon them as a priceless inheritance from the early days of his race.

Perfect Infinitive после модальных глаголов

1. The large body of North Atlantic Central Water must have been formed in the North Atlantic Ocean.
2. Some mistakes must have been made in assembling the parts of the machine.

3. Chalk is made up of the shells of little animals. They must have been tiny things, for you can only see the shells with a very strong glass.
4. The foreign matters such as sulphur and iron, which are found in coals to a varying degree, may have been due to the presence of minerals containing these elements in their neighbourhood.
5. Although the structures proposed may not have been established with complete certainty, all the known facts, physical and chemical, fit beautifully this ingenious interpretation.
6. The geologists teach us that coal has been formed millions of years ago from the enormous quantities of vegetation and trees. The process of their decay must have been very gradual but constant.
7. More might have been said about how some of the important advances in biochemistry have been made.
8. It is evident that the motor car of today could not have been produced in the quantity and quality without the liberal use of forgings.
9. A possible criticism of this work, that oxidative effects may have given rise to the soluble matter, was taken into account in the experiments.
10. A double bond if present would almost certainly have been detected in the infrared or ultraviolet spectrum.
11. In the initial state the distribution of motions may not have been random, but may in fact have been governed by definite conditions.
12. It is worthy of note that coals must have developed in humid climates for the most part, for if the coalfields of the world are charted they are found to lie almost wholly in the humid areas of the world today.
13. It may be concluded that the central water mass of the North Atlantic Ocean is formed by the sinking of surface water and lateral mixing, but vertical mixing may also have contributed to the development of the water mass.
14. The diffraction of electrons might even have been observed before the discovery of X-rays, for thin pencils of electrons had been shot through metal plates as far back as 1894, but no one had thought of photographing the emerging beam.

15. The commercial use of nuclear power, which has already begun, leads mankind out of the inevitable impasse to which the limited resources of carboniferous fuel would have inevitably brought it.
16. The patience of the ancient forgerman must have been remarkable, since he first made his own steel by a slow, tedious process, and probably lost a good percentage during the process.
17. We know that the old mountains are gradually being washed away by the rain, and that new mountain ridges rise from time to time as the result of tectonic activity, but all these changes are still only the changes of the solid crust of our globe. It isn't, however, difficult to see that there must have been a time when no such solid crust existed at all and when our Earth was a glowing globe of melted rocks.
18. A rough estimate of the rate of cooling and growth of the solid crust of our globe indicates that the cooling process must have begun several billion years ago.
19. For us, the people living in the six parts of the World, the expression «solid ground» is practically synonymous with the idea of stability and permanence. As far as we are concerned all the familiar features of the Earth's surface, its continents and oceans, its mountains and rivers could have existed since the beginning of time.
20. The intense mixing that takes place in the Labrador Sea must have had important bearing on the productivity of the subarctic waters.
21. The discussion of the previous section must have made it clear that in order to understand the problem of life in general, we must look for the solution in the structure and properties of the living cells.
22. The experiment is very simple. It does not require any complicated physical apparatus, and gives us definite information concerning the structure of matter. There is actually no reason why it could not have been performed by old Democritus, who was the first to speak about the «grains of matter», and who could have thus given the proof of his views right then. But what seems easy for us now might not have been so twenty centuries ago.
23. The general result of the survey of the accumulation of lead reveals an extremely important fact that no rocks

- exhibit an age of more than two billion years from which we must conclude that the solid crust of the Earth must have been formed from previously molten material about two billion years ago.
24. The study of the motion of stars in general, and in particular the relative motion of double and triple stellar systems, as well as that of the more complicated stellar groups known as galactic clusters, leads astronomers to the conclusion that such configurations could not have existed for a longer time than several billion years.
 25. A dress quite common in our days would have seemed very unnatural to a Greek or a Roman of the past.
 26. Several very striking love poems may possibly have been written by Dante in the early days of his exile.
 27. In ancient times the chanted verse must have been more effective than when read.
 28. A number of ancient buildings of Italy must have been some kind of old Roman water-supplies.
 29. In B. C.¹ 126 Bactria was a Greek kingdom and it may have had already for some time commercial relations with some Eastern countries.
 30. There was little or no science in the primitive musical system, but without it later composers could have done nothing.
 31. There are many different ways of estimating the size of atoms and molecules, and the simplest of them is so simple that Democritus and Empedocles working without modern laboratory equipment could probably have used it had they happened to think about it.
 32. At the height of the glaciation during the Quaternary Period, when the fall in temperature was maximal, the Polar Sea must have been covered with ice further cut in its peripheral parts than at present. The American and Siberian coasts which in the milder climate of our present time are for the most part covered with ice also during the summer, must have been so to an even greater extent at that time.
 33. From the writings of Walter Odington we learn that rondeaus² could be written without text and must therefore have been used at times as purely instrumental compositions.

¹ В. С. — до нашей эры.

² rondeaus — рондо (форма музыкального произведения).

34. If as archeologists believe Bering Strait was the only possible route available to people who did not have the watercraft and navigational skill that would have enabled them to traverse oceans or to go through very difficult waterways, the first people must have come to America by way of the Strait.
35. Of the earliest history of the Greeks we know almost nothing. They were an offshoot of the Indo-European family, and must have separated from the parent stock while still in a primitive stage of advancement. At what date they entered their future home we have no means of determining, but it must have been at a time when Egypt was already highly civilized and very possibly others of the Oriental nations as well. Nor can we tell the route by which the Greeks entered.

Герундий и герундиальные обороты

1. Newton made his most important discoveries before reaching the age of thirty, and many of his successors have done likewise.
2. To prevent the metal parts of ships from being covered with rust under water, various kinds of paint are being used.
3. Without being subjected to a special treatment, raw rubber cannot be used for manufacturing such things as tyres, wire insulation, etc.
4. Besides being capable of producing more consistent and reliable results, an automatic control can sometimes be used where manual control is impracticable.
5. When a body returns to its original position after being slightly disturbed, the equilibrium is said to be stable.
6. We know of Kondakov's having made the first synthetic rubber in the world.
7. We know of silver and copper being very good conductors of electricity.
8. There is no known reaction suspected of its having a molecularity greater than three.
9. The exact operation of some devices cannot be much relied upon due to their being influenced by the changes in the ambient temperature.
10. Only in the middle of the XIX century the fact of the quantity of heat produced being proportional to the work done was definitely stated.

11. The art of the biochemist consists of separating from a piece of mashed tissue — like liver — the various enzymes it contains. Besides using all the techniques of chemistry, old and new, the biochemist operates with devices learned and adapted from the enzymes themselves.
12. The independent-particle model has the advantage of having a high degree of physical visuality.
13. The essential criterion for plastic flow is its being produced in an otherwise solid body by shearing stresses above a critical level.
14. As radio waves travel away from their point of origin, they become attenuated as a result of spreading out due to energy being lost in travel.
15. The loss in radiant energy from the flame front results in there being less energy available for the initiation of combustion processes.
16. By 1897 atoms had definitely arrived, paradoxically enough, by being no longer atoms (uncutables) but by exhibiting a quite disconcerting possibility of being broken up.
18. Graphite is used as a moderator in the atomic pile because of its being cheap and its ability to stand high temperatures.
19. When a neutron is added to the spherically symmetric nucleus there is a definite probability that the energy of excitation, rather than being concentrated on a single nucleon, will actually set the whole nucleus into motion.
20. Mica is widely used as a dielectric in high-grade condensers because of its having high voltage strength resistance.
21. With the present state of science no explosion of an atomic or hydrogen bomb can be carried out without its being registered in other countries.
22. Probably the first indication of there being more than one kind of fluid motion was obtained from the appearance of the free surface of flowing water.
23. The accumulation of a vast amount of information on chemical and other properties has been condensed into a fairly simple and concise table, which has not only enabled the chemist to inter-relate his

- elements but has resulted in his being able to predict the physical structure of the atoms of which those elements consist.
24. The first problem we shall investigate is that of calculating the chance of the electron passing over a distance x parallel to the electric force without becoming attached to a molecule.
 25. The predominance of viscosity is outwardly shown by Reynold's number being very small for steady flow.
 26. Within the Peru Coastal Current upwelling¹ represents a very conspicuous feature. It is caused by the southerly and south-southeast winds which prevail along the coasts of Chile and Peru and carry the warm and light surface waters away from the coast, resulting in cold water being drawn from moderate depths toward the surface.
 27. Some industries have special reasons for being where they are — like the cotton industry in Lancashire, where the atmosphere is normally of just the right degree of humidity for some of the processes.
 28. The book has the merit of being reasonably up to date.
 29. All the main rivers suffer from the disadvantage of being frozen in winter.
 30. Belfast, besides being the capital of Northern Ireland, is the centre of the linen industry, and also a great ship - building centre and port.
 31. People heard of potatoes being an excellent «fruit», so when they had first grown up, they picked the dark berry-like balls which grew among the leaves taking these for the part to be eaten.
 32. Lebedev's having worked out an efficient method of making artificial rubber made our industry independent of imported rubber.
 33. In 1883 Leskov wrote to his friend: «I cannot forgive myself for never having learned the French language well enough to work in it like a native».
 34. According to Greek Mythology the Titans, finally defeated by the gods, were punished by being confined in Tartarus, a region deep down in the earth.

¹ upwelling— поднятие глубинных вод на поверхность.

35. According to a Greek legend Tantalus was sent to Tartarus and there punished by having food and water before his eyes, but always just out of his reach; or, as some writers say, by having a part of a mountain placed above him which at any moment might fall and crush him.

Причастие

Причастие в функции определения

1. Physics is a broad science that deals primarily with phenomena involving the transformation of matter and energy.
2. The stability of the compound being formed must be considered.
3. Hydrogen is the lightest substance known.
4. Different forms of magnetic circuits can be employed, depending on the material used, results desired, cost and other factors.
5. Unfortunately it is not possible to present in this book all the information obtained.
6. One explanation for the discrepancies found lies in the methods of determining the velocities of hydrogenation.
7. The sources of materials used have been recorded elsewhere.
8. It is better to measure the current emitted rather than that collected according to Walker, Wainfan, Weissler.
9. It is hoped that the theoretical background given will be adequate for the purposes of those readers for whom the book was written.
10. The type of complex reaction having been the object of numerous investigations will be discussed in more than usual detail as it illustrates a number of methods of handling complex reactions that may be applied to other cases.
11. It is to be emphasized at the outset that no equation of any sort may be written unless the formulae for all substances reacting and the products formed are known.

12. The theoretical treatment given is based entirely upon the methods of statistical mechanics, since this seems to be the only rational procedure.
13. It is necessary that the instrument be used in accordance with the specification enclosed.
14. The findings appearing to belong to the same period are of considerable interest-to archeologist.
15. In the amount of work done Turner surpassed all other painters, not excepting Rubens.
16. Words have the common property of changing their meaning with use, and the terms used are no exception.
17. Spain ranks as the leading country in the world for the production of olive oil; the amount produced is about as great as in Italy, but the export is about three times as much.

Независимый причастный оборот

1. The northern shores of the Caspian sea are frozen every winter, ice remaining for some hundred days in the colder parts.
2. Molecules are constantly in rapid motion, the motion becoming more rapid with an increase of temperature.
3. The fundamentals of electricity are the fundamentals of electronics, both being branches of physics.
4. Two objects being at the same temperature, the average energy of motion of their molecules is the same.
5. The temperature being raised, the kinetic energy is increased.
6. Infra-red rays being invisible to us, photographic films and plates are made to-day which are sensitive to them.
7. The evaporation increases with the temperature, other things being equal.
8. In the steam engine the fuel burns comparatively slowly, the heat being used to generate steam.
9. Power is the basis of civilization, all industry and transport being dependent upon power in some form.
10. It is generally possible, by suitable means, to separate the constituents of solutions, one method being by distillation.
11. X-rays are usually produced by bombarding a metal target with a beam of high voltage electrons. This is done inside a vacuum tube, the X-rays passing out through the glass wall of the tube in a well-defined beam.

12. With the preliminaries completed, let us consider six hydrogen nuclei arranged in a regular hexagon of the usual bond distance.
13. The name electronics is known to be derived from the word electron, the electron itself being the basic unit of negative electricity and all electric currents consisting of electrons in motion.
14. When the probe enters the sediment it is heated by friction, the rise in temperature being larger the smaller the diameter of the probe.
15. Some types of machine tool equipment may be used to the best advantage in several of the industries, such industries not necessarily being similar in nature.
16. A large number of new entries is included in this edition, many of them referring to problems that had not been recorded before.
17. A small amount of sugar being heated in a test tube, the sugar melts, turns brown in colour, gives off gases and finally dries to a solid black residue which can be identified as carbon.
18. There being no other traffic, the driver can maintain a constant speed of, say, 60 km/hr.
19. The amount of energy of any river depends upon two circumstances, its volume and its velocity. Other things being equal, the velocity is dependent upon the inclination of the river-course: the steeper the slope, the greater the velocity.
20. The deepest and second largest lake in the world, Lake Baikal, with a measured depth reaching 1,741 metres, is located in Siberia.
21. The brightness of the Sun can be predicted theoretically the first calculations along these lines having been made by Eddington.
22. Cosmic rays have been observed to end their paths from outer space in violent nuclear collisions, the latter being known to take place high above the earth.
23. Petroleum being undoubtedly of organic origin, it is still a matter of some doubt whether of vegetable or animal origin.
24. The occurrence of metals in the earth's crust is unequal, some of them being plentiful, the others existing only in small quantities.
25. The chief power of magnet to attract or repel is concen-

trated at certain poles— located at the ends of bar magnet — one being known as a north pole and the other as a south pole.

26. It was early recognized that all the rocks were surprisingly similar in chemical composition, this fact having been confirmed by the subsequent examination of rocks from different parts of the world.
27. The weight of all the molecules of a substance being the same, the molecules are considered to be composed of exactly the same number and the same kind of atoms.
28. A generator of electric current can be defined as a machine which converts mechanical energy into electrical energy, the direct current generator, or dynamo, being one which supplies unidirectional as distinct from an alternating current.
29. It is a fundamental property of all actual media that, entropy remaining constant, the pressure increases with increasing density.
30. From the administrative standpoint Italy is divided into ninety-two provinces, each controlled by a prefect and named after the chief town.
31. The existence of the breezes is recognizable in the records at some British stations, though they are overshadowed by the general winds, their light currents being lost in the deep and vigorous movements.
32. The distribution of sea lions is not uniform, there being concentrations in certain of the flat rocky areas.
33. Shevchenko graduated from the Academy of arts in 1845, and removed to Kiev. There he plunged into intense creative activity, his work becoming the expression of the hopes and aspirations of the younger generation of Ukrainians.
34. Copernicus had devoted much time to observation of the planets with reference to measuring their distance, his efforts having been attended with considerable success.
35. Conditions on the South coast of Alaska are unlike, the prevailing easterly winds resulting in frequent invasions of cold air across the west coast, which produces low temperatures.
36. The British system of weights and measures has evolved from units having many origins, many of the units having been introduced into Britain at the time of Roman conquest.

37. In his discussion of the currents of the South Atlantic Defant (1941) shows that in lat. 30° S to 45° S the stream lines of the currents¹ are wavelike, the apparent wave length being 850 to 880 km.
38. Chinese actor was taught to sing, to walk on a rope and to perform a variety of gymnastic exercises, such as standing on his head, or turning somersaults². His first classification was as male or female actor, no women having been allowed to perform since the days of the emperor Ch'ien Lung (1736—1796).
39. There being no scenery, no furniture except the slenderest kind upon the stage, the Chinese actor had to create in the minds of his audience a belief that all these missing accessories were nevertheless before his eyes.
40. In 1890, with his health already undermined by tuberculosis, Chekov undertook the difficult journey across Siberia to Sakhalin, the convict island, where he did a prodigious amount of work in studying the conditions of the people deported to the island under sentence of penal servitude.

VII. ЭМФАТИЧЕСКИЕ КОНСТРУКЦИИ

Эмфатическая конструкция It is (was)... that
(which, who)

1. It is the gravitation that makes the satellites move round the earth.
2. It is among the naturally occurring minerals that we find the most beautiful examples of crystals.
3. It was from the detection of otherwise unexplained lines in the solar spectrum that helium was discovered.
4. It was not until the industrial revolution that metals began to assume the importance they now possess.
5. It is the width of the energy gap that determines whether a crystal is an insulator, semiconductor, or a metal.
6. In phenomena such as oxidation and corrosion it is the surface rather than the body of the metal that is affected.
7. It was not until 1850 that mechanical equivalent of heat has been measured by Joule and utilized by Helmholtz to establish the principle of conservation of energy.

¹ currents — направление течения потоков.

² turning somersaults — кувыркаться.

8. It was the need for large-scale ballistic computations which gave rise to the development of electronic computers.
9. It was the study of intermediate-sized particles, small enough to be influenced by molecular motion but still large enough to be seen through a strong microscope, which gave scientists their first proof of the kinetic theory of heat.
10. It was the fluorescing of the glass walls of an X-ray tube that led Becquerel to look for what he regarded as invisible fluorescence.
11. It is only now that microwave spectroscopy appears to have matured to the point where one can attempt a book of some perspective and lasting value.
12. It was on November 24, 1831, that Faraday demonstrated to the Royal Society that an electric current can be produced in a coil of wire when a neighbouring electric current is made or broken.
13. In Europe the twelfth century saw the first canals cut by the Dutch, but it was not till the fourteenth century that the invention of locks in Italy made inland navigable.
14. It is the sun shining on the drops of rain, as they fall, that makes those beautiful colours in the rainbow. It is because every little raindrop is a round ball of water, that the bow itself is curved or round.
15. It was only because they espoused the cause of the working class and saw in it the new, rising, transforming force in history, that Marx and Engels were able to discover the laws of social change.
16. While in the study of the solid crust of the earth it is the structural and historic elements that predominate, in that of the waters and airs it is the dynamic elements and the rapidity of change which need to be understood.
17. Ironically enough it was Pasteur, himself a chemist by training, who eventually convinced the scientific world that all fermentative processes are the results of microbial activity.
18. All life ultimately depends on absorption of light, for it is the absorption of sunlight by the green leaves of plants which keeps the plant and animal world alive.
19. It is a continuing process of differentiations of fields of knowledge and ever-increasing specialization within each field which requires increasing attention to theoretical research.

20. It was in the war between Russia and Turkey in 1787—91, as a result of which Russia consolidated her hold on the Black Sea coast, that Ushakov distinguished himself as a commander.
21. The most significant factor in desert climate is the rainfall, since it is the insufficiency of rain that brings the desert into being.
22. The harnessing of the waters of the Rhone (France) was first discussed as long ago as 1911, but it was not until 1934—that the present program of the construction of a huge dam took shape.
23. It is our generation that can accomplish that which all preceding generations failed to accomplish — this generation has the capacity to eliminate warfare.
24. Glinka was convinced that it was in Russian folk music that he should seek the basis for his own creative work.
25. It was Fielding's active life which gave him his knowledge of men and women and developed in him that sense of universal irony which has made his novels of life in a corner of England reflect the life of all humanity.

Инверсия (обратный порядок слов)

а) после некоторых союзов, наречий и союзных наречий

1. Never before has there been any device so versatile and efficient in handling electricity as the electron tube.
2. Hardly ever is light observed directly from its source.
3. Not only does water function as a catalyst, but it also may be a significant rock-building constituent.
4. Only gradually, in recent years, has the chemistry of high polymers become separated and become an independent branch of chemical science.
5. Not only can a computer deal with calculations of many different kinds, but it can be switched rapidly from one to another.
6. Nowhere can we see such rapid progress as in computing technique.
7. Not only has the thermal stability of the paraffines been the object of investigation but also the thermodynamic stability of these substances.
8. Unfortunately records of evaporation are not very numerous nor are they readily comparable since different types of evaporations give different results.

9. Only recently has a theory which accounts reasonably well for all the experimental evidence been proposed.
10. No sooner had electronic computers become available for non-military uses, after the end of world war II, than astronomers began to avail themselves of this new tool.
11. A mineral in the cavity has somewhat less free energy than the same mineral in the rock. Not only does a small cavity provide a favorable place for formation and growth of newly stabilized minerals, it also represents a place to which the surrounding minerals would be transferred by chemical transport (activation, migration and consolidation).
12. Not only has the absolute number of cases of multiple primary malignant tumors reported increased in recent years but also the frequency of this phenomenon has seemed to increase.
13. It had long been understood that sound was related to the vibration of a mechanical system, but not until Galileo Galilei (1564—1642) attacked this problem was it clear that pitch is determined by the frequency of vibration.
14. Not only do men fly in the upper layers of the atmosphere, but the time is not too far off when they will leave the Earth and explore other planets.
15. The most brilliant planet is Venus. So bright is it that even in the daytime it is sometimes faintly visible.
16. Not only do the tides advance and retreat in their eternal rhythms, but the level of the sea itself is never at rest.
17. Hardly had the constitution of Athens assumed its democratic form when the state was called upon to take a foremost part in the desperate struggle of the European Greeks to keep themselves from absorption in the great oriental empire of the Persians which had been created by Cyrus and successors.
18. Minerals like clay, chalk, stone and slate do not shine when we rub them, nor do they melt in the fire.
19. There can be no doubt that the popularity of organic reagents is deserved. Nor has descriptive literature in the field been lacking.
20. Schryver and Duston did not determine the position of the amino and hydroxyl groups, nor did they establish the structure of the acid by synthetic means.
21. Solubilities of analogous compounds sometimes vary indiscriminately within a group rather than in the order

of atomic weights. Nor is the change in the basic properties always gradual.

22. The original state of all the matter in the world is not known; nor can we predict what would happen if all molecular speeds were reversed.
23. No longer is the tissue thought of as the unit, nor even the cell; the interest lies in the mechanism whereby the various components of the cell synthesize protein and eventually export it.
24. The causes of the fluctuations of the inflow of warmer waters near Spitzbergen are not known, nor is it known whether these fluctuations are periodic in character, and the same statements apply to fluctuations which occur in other regions of well-defined currents.
25. Unfortunately records of evaporation are not very numerous, nor are they readily comparable since different types of evaporation give different results.
26. The Greeks were an offshoot of the Indo-European family. At what date they entered their future home we have no means of determining; nor can we tell the route by which the Greeks entered.

б) вынесение на первое место в предложении предикативной части сказуемого (причастия I и II, прилагательного)

1. Moving around the nucleus, and at a considerable distance from it, are the rest of the electrons required to make the atom neutral.
2. Closely related to the true catalyzed reactions are induced reactions.
3. Allied with the construction of the dam and power station are other major undertakings.
4. Related to the chemical activities are the well-known physiological effects.
5. Presented on the following pages are synopses¹ of work undertaken by investigators in the jet propulsion field.
6. Extending outward from either end of the visible spectrum are other radiations not visible to the human eye but capable of detection by other means.
7. Somewhat related to these views are those of Zener who believes that electrical conductivity of certain compounds is due to charge transfer from one metal to another.

¹ synopses — краткий обзор, синопсис.

8. Surrounding the nucleus and conferring electrical neutrality on the atom as a whole, is a set of Z electrons arranged in a series of «orbits» or «shells» and moving in these orbits rather as planets round the sun.
9. Included in this work, however, were the crystal structures of two minerals, diamond and graphite, where the atomic arrangements are fundamental to organic chemistry.
10. More significant is the failure to resolve the K and L groups of electrons in the case of argon.
11. Most baffling was the existence of isomers; e. g., the compounds; $\text{CoCl}_3 \cdot 4 \text{NH}_3$ could exist in two forms, a violet one and a green one.
12. Included in the interval between the time of addition of virus and cessation of cell division is the time required for entry and «uncoating» of the virus.
13. Included in the group of compounds to be considered are substances differing widely in constitution and mode of action, yet possessing the common property of forming insoluble organometallic salts under certain well-defined conditions.
14. The problems of the electronic state of macromolecules have in many respects similarity with that of the crystalline solids. However, there also are many problems characteristic to the macromolecule. Especially interesting are the problems concerning the biopolymers such as the nucleic acids and the proteins.
15. Located in the south-west of Shantung Province are the Taishan mountains, the tallest in all that part of the country.
16. Situated at the mouth of the Neva River, which flows into the Gulf of Finland, is Leningrad built on more than 100 islands at the delta, united by 548 bridges.
17. Coupled with the phenomenon of growth of population is the constantly increasing annual kilowatt hour usage per capita.
18. At the end of a rainstorm, many fine drops of water are suspended in the air. Emerging from each drop are the rays of all spectrum colors, each at a different angle.

в) в уступительных придаточных предложениях

1. Difficult as it was, the author made up his mind to illustrate the volume with his own hand.
2. We see how delicately balanced is the operation of a modern blast furnace, huge as it is.

3. Important as the inductive effect is, it often fails badly if used to predict differences in reactivity among aromatic compounds.
4. Essential and valuable as the physical picture of stability is, mathematical definition provides more useful and exact means of describing system performance.
5. Our present knowledge of oncology, limited as it may be has tended to show that carcinogenesis ¹ is not an isolated biological accident.
6. However plentiful the ore may be the extraction of a metal will not be profitable unless it is sufficiently suitable for some purpose to be sold at a price that will pay for extraction.
7. However useful the ore may be, it cannot be employed to advantage unless it can be obtained in adequate quantities and at a price commensurate with its utility.
8. Strange as it may seem, the theory of numbers, being the purest kind of mathematics, can be called, from a certain aspect, an empirical or even an experimental science.
9. Radicals can usually be formed and trapped however viscous or rigid the solid phase may be.
10. The fact that life appeared on our Earth rather soon after the formation of the crust indicates that, improbable as it seems, the accidental formation of a complex organic molecule required probably a few hundred million years.
11. This summary account, brief though it is, gives a general idea of the conditions which influence the natural vegetation and cultivated crops in the countries we have to consider.
12. Important as Mechnikov's discoveries were in themselves their significance is further magnified by the impetus they gave to the development of the comparative and evolutionary trend in physiology.
13. Suffering though he did from tuberculosis, Dobrolyubov worked with terrific energy, pouring all the passion of his being into the fight for the cause of the people.

¹ carcinogenesis — образование раковых опухолей.

VIII. БЕССОЮЗНОЕ ПРИСОЕДИНЕНИЕ ПРИДАТОЧНЫХ ПРЕДЛОЖЕНИЙ

1. The weight of an atom depends almost entirely on the number of protons and neutrons it contains, since the electrons are so light that they contribute but little to atomic weight.
2. There is an easily remembered method for finding the relative directions of the current and of the magnetic field it sets up.
3. The method of successive approximations which is due to Picard, furnished a mode of attack quite unlike any the student has used hitherto in solving differential equations.
4. The only thing the ions seem capable of doing is to form a hydrogen-bonded complex.
5. The only time the spectrum is characteristic of a single bond is in diatomic molecules.
6. It has been seen that the space-lattices can be classified in seven systems, according to the symmetry of the special forms they assume.
7. The primary act of conversion of energy in photosynthesis was found to involve the separation of negative electrons from the positive «holes» electrons leave behind when they move.
8. One of the unsolved problems of marine biology is the definition of the proportion of organic matter which is decomposed by the time the particulate¹ material sinks to various depths.
9. In astronomy it is customary to speak of very large distances by giving the time they could be covered by light that travels at the tremendous velocity of 300 000 km per sec.
10. Rocket engines are classified by the type of propellants they use.
11. It would be expected that the Antarctic convergence would move northward as the speed of the surface currents increases; but the evidence we possess does not support this conclusion.
12. The problem we have set up in the previous paragraph is indeed formidable and if it could be solved, we could presumably predict the crystal structure of any solid.

¹ particulate — размельченный.

13. It is by the agency of radio we receive most of the information the satellites are collecting at the borders of space.
14. The mechanism of a reaction is simply the path the molecule follows in going from reactant to product.
15. Were there no loss of energy by friction, the motion would continue indefinitely once it had been started.
16. It is customary in calculating the moment of inertia of a molecule to assume each atom has the proper number of electrons to make it neutral and that the entire mass of the atom is concentrated at a point.
17. The most important effect the Moon has on the Earth is in the production of the tides.
18. One will find many of the Indian's habits of dress and work have not changed in centuries.
19. The long road to the stars is growing shorter but there are still many obstacles we must overcome.
20. Every hypothesis is bound to explain, or, at any rate, not to be inconsistent with the whole facts it professes¹ to account for.
21. Had there been no earth's gravitation the satellites would have moved through airless space in a straight line at a uniform speed. It is the gravitation that makes them move round the earth.
22. L monosov was the first scientist who found heat, light and electricty are different forms of matter..
23. In the making of netsuke² importance is attached to the esthetic effect it may produce when in active use.
24. Asked to describe «the process of his work», Chekhov gave an illuminating, though by means exaggerated account of the way «popular plays» were usually written in those days.

IX. НЕПОЛНЫЕ ПРИДАТОЧНЫЕ ПРЕДЛОЖЕНИЯ

1. Oxides of metals when found naturally are called ores.
2. The catalists are most active when in soultion.
3. A gram of water is proved to change exactly to a gram of ice when freezing and to a gram of water vapour when evaporating.

¹ to profess — претендовать.

² netsuke — японская миниатюрная скульптура.

4. While discussing electrical conductivity it is of interest to refer to the electronic structure of silver and copper.
5. It is interesting to compare the conditions as found in our waters at mid-summer with those in the surface waters of the tropics.
6. The ideal solution law, as embodied in Raoult's law, provides the basis for the treatment of simple molecule solution.
7. Whatever the season, life on a drifting station is severe.
8. In 1932, while studying the properties of cosmo, Carl Anderson discovered a positive particle whose mass and charge were just equal to those of the negative electron. This particle was called the positive electron.
9. Oily waste and light materials such as waste paper, straw, etc. catch fire less easily but burn vigorously once started.
10. Sulphur and iodine, though often considered insulators do have some properties that we consider those of a semiconductor.
11. In many polymers crystallisation is accompanied by changes in the infrared spectrum, as evidenced by bond splitting and deepening of certain other bands.
12. A cubic foot of air when heated from 0°C expands by no less than 493 cubic inches.
13. The oxygen content of water of varying salinity when saturated with air has been determined by Fox (1907) between 0° and 30°C .
14. Though predominantly aerobic some of the deep-sea bacteria develop anaerobically.
15. A two-dimensional pattern when illuminated by parallel monochromatic light gives a two-dimensional diffraction pattern.
16. The waves from remaining atoms, if in opposition to those from the heavy atom, reduce its intensity.
17. The element nitrogen as found in nature is either in the free state or in combination.
18. In the absence of any obvious supply of free oxygen below the mud-water interface in the ocean the organic matter must be attacked by anaerobes, if by any kind of bacteria.
19. At any given pressure there is a temperature at which one fuel will crack — if subjected to the condition for

- a sufficient period of time — and depending on the fuel composition this time may be surprisingly short.
20. It would appear that primitive bacteria have developed into other organisms having less rather than more, chemical adequacy if taken separately.
 21. Glass at ordinary temperature is a good insulator, but when heated approaches a state of conductivity and when red hot is a good conductor. Dry wood is an insulator but when subject to moisture becomes a good conductor.
 22. Primary tropical forests are supposed to have been little, if at all, affected by man and are believed to have existed much as they are now from a very remote period.
 23. A significant feature to be borne in mind when speculating on the nature of the earth's interior is that even though it is probably made up of material chemically similar to that with which we are familiar this material, if solid, probably exists in polymorphic forms unknown to us.
 24. Soviet poetry in wartime has produced a number of works which when taken together afford something of a panorama of the country's experiences during the war.
 25. «When writing — says Chekhov. — I rely entirely on the reader to add the missing subjective elements in the story».
 26. The term hydra-headed is used to describe an evil which, if overcome in one place, breaks out in another.
 27. In modern music we have the whole system of harmony as known in the early part of the tenth century.
 28. Velasques was such a gifted man that it comes as no surprise to learn, that he, when only twenty-four, was appointed painter to the king.
 29. Chaikovsky's chief motifs running through his music are an impassioned love of life and a tireless quest for happiness. The theme of the overture «Romeo and Juliet», the Fantasia «Tempest» and the «Francesca da Rimini» fantasia is that of love which, though tragic, struggles to overcome obstacle.

Х. НЕКОТОРЫЕ ДРУГИЕ ТРУДНОСТИ

**Парные союзы the...the с прилагательным
или наречием в сравнительной степени**

1. The heavier a floating body, the greater the weight of liquid it will displace.
2. The more highly charged the bodies are, the greater will be the repulsion or attraction.
3. The higher the purity of titanium, the easier it is to fabricate, but the lower is its strength.
4. It is usual that the slower the rate of cristallization, the more perfect are the resulting crystals.
5. The greater conductivity a substance has, the less is its resistance.
6. The higher the temperature of a piece of charcoal, the faster it will burn.
7. The greater the compressibility of a gas, the lower the speed of sound.
8. The larger the screen of a television receiver, the more light must it emit if the picture on it is to appear satisfactory bright.
9. In winter ice forms on the underside of the flows, but the thicker the ice the slower the freezing.
10. The more tender the place on the body where the disease attacks, the more aggravating it is.
11. It has been observed that the stronger the electrophilic metal halide, the higher is the molecular weight.
12. The better you concentrate on what you're reading, the more you will be able to distinguish between what's important to you and what isn't.
13. It is meaningless to attempt to assign any definite path to a particle. It is like assigning a definite path to a ray of light; the more sharply we try to define it by narrow slits the more widely the ray is spread by diffraction.
14. The more ideal the conditions under which a crystal is grown, the slower it approaches in perfection to regular geometrical figure.
15. Whatever the nature of the metal, the slower the rate of cooling the larger will be the size of the crystals after solidification.
16. In the passing of current through the conductor, resistance results in the giving off of heat; the greater the

resistance the greater the heat for the passage of a given current.

17. The more surface the material being burnt presents to the air, the more rapidly burning takes place.
18. The larger the number of different elementary operations, the more complicated the design of the machine and the greater the amount of the equipment needed.
19. Many materials are suitable insulators (dielectrics), and it might appear that the higher the dielectric constant the more suitable the material.
20. The molecules are involved in a permanent irregular motion. We call it "thermal motion", since we perceive this motion as the phenomenon of heat: the faster the motion, the hotter the body, the rising temperature being simply interpreted as the increase in the kinetic energy of separate molecules.
21. Since the barometer measures the pressure of the atmosphere, the greater the elevation, the lower the barometer reading.
22. When you look at the object with two eyes, you automatically focus them both on the object. The closer the object the more you have to turn your eyes toward each other, and the muscular feeling arising from such adjustment gives you a pretty good idea about the distance.

That (of) и those (of)

как заместители существительного

1. The most familiar temperature is that of a human body.
2. The boiling point on the centigrade scale is 100° and that on the Fahrenheit is 212° .
3. The physics of things at rest is much simpler than that of things in motion.
4. Planetary theory was not developed to the same degree as that of the Moon.
5. As a matter of fact the atoms have an irregular to-and-fro motion similar to that of the electron.
6. One of the central problems of biology is that of metabolism.
7. To ensure that equilibrium obtains, measurements can be made with an apparatus similar to that shown in Figure 2,6.

8. In more recent times the papers in biogeography have been few in comparison with those on climatology and geomorphology.
9. Any automatic computer must be able to store numbers—both those forming the data of the problem, and those generated in the course of the calculation.
10. The only form of power first known to man was that of his own muscles.
11. The properties of natural rocks are to some degree comparable with those of artificial materials.
12. For many centuries the materials which primitive man used for building his houses were those that came easily to hand such as stone, wood and mud.
13. The most useful classification is that furnished by the Mendeleev's Periodic System whereby the elements are arranged in periods and groups.
14. Natural atmospheric characteristics do not necessarily coincide with those specified for the standard atmosphere.
15. In order to see the molecules separately we must necessarily use radiation with a wavelength thousands of times shorter than that of visible light — or, in other words, we have to use radiation called X-rays.
16. Plutonium has a low melting point, 640°C , comparable to that of aluminum and magnesium. Its vapour pressure is so low that its boiling point of 3300°C compares with that of uranium. Its room-temperature density is higher than that of uranium.
17. The original organic matter particularly that in oil-rich diatoms, may consist in part of hydrocarbons which bacteria liberate during the decomposition of associated proteins and carbohydrates.
18. Television, the transmission of visual images from studio to receiving screen, presents problems compared with which those of broadcasting appear very simple.
19. By means of an instrument called the spectroscope, astronomers and physicists have discovered that the elements which compose the sun and the stars are almost exactly the same as those that compose the earth.
20. In spite of the enormous mass of the sun compared with that of the Moon, its effect on the tides is less than that of the Moon. This is because it is so far away from the Earth —nearly 400 times as far as the Moon.

21. Lomonosov set himself a very unusual problem for his time — that of creating «mathematical chemistry».
22. Telescopic studies reveal the existence, far away in space, of many giant groups of stars very similar to that to which our sun belongs.
23. The waters of Baffin Bay are partly separated from those of the Labrador Sea by the submarine ridge across Davis Strait.
24. The Swiss Alps occupy as it were an intermediate position between the conditions in the extreme west of Europe and those in the south-east.
25. Everyone knows that the climate of most of Canada differs greatly from that of the British Isles, though large parts of Canada are in much the same latitude.
26. The growth of biology in the twentieth century has been at least as great as that of physics, even though in its history there have been no such dramatic changes.
27. The Arctic Coasts are those with the greatest variability but since there is little likelihood of important agriculture or grazing in these regions this is not a matter of great concern.
28. The waters of the Labrador Sea are at all depths in free communication with those of the Atlantic Ocean, therefore the Labrador Sea should be considered not an adjacent sea but a part of the Atlantic.
29. Since life on earth is geared to water, there is a tendency on our part to compare the properties of other substances to those of water.
30. How the atom bomb was developed, tried out and used is now part of world history and not merely of that of science.
31. For the ancients, very large numbers such as those of the stars in the sky, the fish in the sea, or grains of sand on the beach were «incalculable».
32. Between 1838 and 1848 the first national workers movement, that of the English Chartists, reached its height.
33. Modern Russian versification has several points in common with that of other European literatures, in particular German and English.

Некоторые функции one

1. In this presentation one should follow a logical rather than a historical order, though referring to the historical aspects where they are of interest.
2. The history of radar is a long one, for the underlying principle has been known to science for a long time.
3. Generally, a liquid having a free surface is one on whose surface there is absolutely no pressure.
4. One must use special instruments for measuring the resistance in the circuit.
5. Three-dimensional models often contain initial stresses which one cannot evaluate until a test is completed.
6. Of all the senses, vision is the only one that can make us directly conscious of things at great distances.
7. It remains to discuss mixed crystals but we shall confine attention to ideal ones in which the components mix perfectly.
8. Exact knowledge of the state of the system at one time enables one to determine its exact behaviour in the future.
9. One can hardly proceed in any exploration without some definite objective and some idea of what one is likely to get.
10. Lavoisier was firm in the conviction that one may take it for granted that in every reaction there is equal quantity of matter before and after the operation.
11. As we have just noted there was a time when heat was supposed to be a sort of substance or fluid which flowed from a body of high temperature to one of lower temperature.
12. If one seeks to determine the influence of the winds on the surface temperature of the ocean, he must examine the condition of the surface layers in the different seasons of the year.
13. Combining the information concerning the central temperature of the sun, with the known facts concerning the reaction rates of various nuclear transformations one can find out which particular reaction is responsible for the energy production in the sun.
14. The value of the electric moment alone does not enable one to determine the exact dimensions and geometry of the molecule, but it does disclose whether or not the atoms are arranged in a symmetrical way

15. From these studies it appears that the electron, the proton, and the neutron are not the only elementary particles or nucleons but merely the stable or long-lived ones.
16. One can assume that the mechanism of energy transfer is the same in the liquid as in the gas.
17. No one can be expected to derive any considerable number of the formulas or to keep them in mind.
18. Acid solutions are preferable to alkaline ones as they are less likely to give deposits of oxides or basic salts at the cathode.
19. Often it isn't the complex element that causes troubles but the simple one.
20. One has still the impression that much work in the field of chromatography is too empirical.
21. At present one could produce temperatures comparable to those encountered in stellar atmospheres.
22. Most of the substances, especially the organic ones, that we encounter in ordinary life, are heterogeneous even though in many cases we need a microscope to help us recognize that fact.
23. When one has experience one may be able to design plants which just must have a computer because otherwise they won't work efficiently.
24. It is customary to regard as a solid anything which to a certain extent, resists deformation. From this standpoint one would think of ordinary glass as a solid.
25. Since no alternate mechanism for protein synthesis has been established, one must assume that ribosomes are of universal occurrence in microorganisms, higher plants, and animals.
26. The compass is very useful in practical work, for it enables one to determine the polarity of various poles of motors and generators.
27. One should know that the electric cell is a device for converting chemical energy into electrical one.
28. The interior of the Earth is a problem at once fascinating and baffling, as one may easily judge from the vast literature, and the few established facts, concerning it.
29. One has only to compare Velasques with the Dutch painters, to see with what magnificent simplicity he renders costumes.

30. Certainly, one cannot read far on any text in classical mythology without seeing that the virtues and weaknesses of human nature are mirrored in these fables of the gods.

Некоторые функции глагола to do

1. Many substances after being rubbed behave as amber does.
2. The wireless waves of radar return from an aeroplane just as do those of searchlight¹.
3. Nitric acid, the most important of the oxyacids, does not occur free in nature, but its salts are to be found in all fertile soils.
4. A gas has no boundary surface as do liquids and solids.
5. There is some evidence that molecules do exist in solution of certain typical salts at high ion concentration.
6. Some computers — more particularly those designed for commercial work — do, in fact, operate in decimal² throughout.
7. In higher latitudes the breezes are irregular, and usually so light when they do occur, that they pass unnoticed save by the trained observer.
8. The addition of heat does not increase the weight of metal and the combination with air does increase its weight.
9. Substances burn more rapidly in oxygen than they do in air because the concentration of oxygen in pure oxygen is about five times its concentration in air.
10. We know that the electrical system in an automobile and an airplane uses direct current and so do the telegraph, the telephone, and the train, to say nothing of laboratories requiring direct current for their experimental work.
11. To-day it seems certain that a given ion does have a definite mobility, one that does not change with time.
12. Extremely complicated analysis does occur in quantum calculations particularly for atoms and nuclei.
13. Purely chemical studies of virus material did establish the fact that a given virus might be considered as a well-defined chemical compound.

¹ searchlight — прожектор.

² decimal — десятичная система.

14. Due to the non-coincidence of the geographic and magnetic poles and to the presence of magnetic materials in the earth, the compass needle does point to the true North in only a few places on the earth's surface.
15. In accordance with the principle of conservation of energy, the work expended by the charge is not lost but does give rise to an equivalent amount of energy of some kind.
16. Ice does change back to liquid water when it is warmed.
17. Why molecules have the particular shape they do have will not be discussed here.
18. Certainly biology occupies a far more important place in our general life and thought than it did at the beginning of the century.
19. The sun rotates on his axis just as the earth does, from west to east, but takes longer to complete a rotation.
20. The earth attracts a ten-kilogram weight ten times as strongly as it does a body weighing one kilogram.
21. One finds that southern Canada resembles southern Siberia and north China much more than it does Britain.
22. Pasteur first demonstrated that air really does contain microscopically observable «organized bodies».
23. In hot countries, there is a kind of bats which do attack men and cattle.
24. There is no one spot on the whole globe where there is not some rainfall, be it much or little; and the Sahara does have its rains.
25. Only after the famous around-the-world sailing of Fernando de Magellan did the last doubt about the spherical shape of the Earth finally disappear.

Некоторые функции глагола to be

1. The geologist's first task is to locate geological conditions suitable for the existence of oil.
2. The purpose of electric lighting is to provide general illumination.
3. The truth of Joule's discovery is to be found in everyday life.
4. If radiation is to occur at certain critical frequencies, absorption must also occur there.
5. A scientist must have the gift of looking into the future if he is to plan his work properly.
6. The main objective will be to study the general circulation of the atmosphere.

7. The greatest amount of plant life is to be found in coral reefs.
8. Nitric acid, the most important of the oxyacids, does not occur free in nature, but its salts are to be found in all fertile soils.
9. Great contrast is to be seen between soils formed beneath forest cover and those of open grasslands.
10. The new techniques are essential if we are to make analyses on shipboard in sufficient numbers.
11. Particularly for development and production of semiconductor devices, knowledge of and control over material homogeneity is essential if a uniform product is to be obtained.
12. Metamorphosed specimens of fishes are to be met with at 35 m below the surface.
13. As is to be expected in a flow towards the south in the Southern Hemisphere, the coldest water is found inshore and the sea surface rises when departing from the coast.
14. The delta sediments of Congo and Magdalena rivers are to be found in the alluvial cones at the mouths of their submarine canyons.
15. We have already seen that for a relatively large number of animals of Mediterranean-Atlantic coastal waters the South-western entrance to the English Channel represents the northern boundary, but quite a number of others are to be found also further north.
16. Different purposes and circumstances will require us to apply different procedures and devices if we are to achieve the greatest possible benefit.
17. Owls are to be found in almost every country in the world.
18. Several very ancient buildings are still to be seen at Anuradhapura in a fair state of preservation in spite of the more than two thousand years that have elapsed since they were first constructed.
19. For Mallarme verse is to be approached as a musical phrase, as a small orchestra, a kind of chamber music.
20. At the age of seventeen, if we are to judge by the landscape which he painted, Leonardo was a remarkably mature artist commanding a style of his own.
21. Some elements of detective fiction are to be found transmuted in psychological novel of the type of Dostoievsky's «Crime and Punishment».

22. Some of the largest and finest museums of the country are to be found in Leningrad, among them the Hermitage with its priceless collections, the State Russian museum, and the Museum of the Revolution located in the Winter Palace.
23. "Chiaroscuro" is a technical method of painting practically invented by Leonardo and destined to exert a tremendous influence on painting. The richest effects in chiaroscuro are, of course, to be had in paint, but he obtains in black and white, by the simplest means imaginable, results almost equally astonishing.

Некоторые функции глагола to have

a) to have + Infinitive —

в составном глагольном сказуемом

1. The radio frequency has to be chosen such that its period equals the time it takes for the ions to make one revolution.
2. The monomer had to be purified thoroughly before polymerization could be achieved.
3. As is true of every author, we have had to be a little arbitrary in deciding what to include and what to omit.
4. Almost every new material studied has to be given special consideration and often investigated by a special method.
5. Until the Schroedinger equation can itself be solved explicitly, we shall have to content with such advances as are represented by the transition-state theories.
6. Formerly in Germany and in France, farmers had often to be forced by the government to plant potatoes which they declared fit only for pigs.
7. Qualitative quantum chemistry has to be based on an orbital description.
8. Several special sensing elements have to be developed for use in this reactor.
9. In any analysis the materials of which the apparatus is made have to be taken into account; it is doubtful whether sufficient attention is always paid to this aspect of fundamental procedure.
10. The antarctic water can be discussed without entering upon details of the conditions in the neighbouring

oceans, in which case one has to establish oceanographic boundaries between the Antarctic Ocean and the neighbouring areas.

б)оборот «to have + существительное + Infinitive»

1. It is possible to have forces act on bodies without producing motion.
2. Under given conditions it is most useful to have the plate rest on a horizontal table.
3. The accuracy of a system is its ability to have the controlled variable maintain the desired value with a minimum of error.
4. In making special shapes it is necessary to have the clay fill every corner of the mold.
5. With the construction of fig. 16 it is possible to use alternating current in the filament proper and still not to have the alternating potential drop in the filament effect the electron stream leaving the cathode.
6. It seemed to be a matter of some importance to have the numerical values in the text correspond with the best accepted values.
7. These materials have their experimental results deviate from linear dependence in the coordinates.
8. With the advent of transistors and magnetic devices, it became more efficient to have these devices perform both the logic and power amplification.
9. It is possible either to impose a fixed thermal programme on a reactor by supplying or withdrawing heat, or to have the reactor operate autothermically.
10. It is important to have the test object to be in accurate focus on the plate in the camera, otherwise strange deviations occur.
11. In the winddriven ship with no sails the forward motion is brought about by having a steam engine rotate two vertical cylinders.
12. It is certainly more satisfying to have the story follow a rational pattern.
13. When Mendeleev was constructing his table, it was obvious that several gaps should be left in order to have the succeeding elements fall into their proper groups.

**в) оборот «to have + существительное +
Past Participle»**

1. The majority of molecules have all their electrons paired.
2. The factors determining the order in which ions have their charges neutralized at the electrodes will be considered.
3. In nitric acid and its esters the nitrogen atom has all its electrons shared.
4. When the grass is tall enough, we have it cut down and made into hay.
5. All electromagnetic waves have their energy divided equally between an electric field and a magnetic field.
6. A molecule with an even number of electrons usually has all electrons paired so that the total spin is zero.
7. The other methyl group has its equilibrium positions rotated to avoid close proximity with the protons of the first group.
8. Scattered rays seem to be primary rays which have merely had their direction altered by the matter through which they pass.
9. It would be desirable to have these curves drawn for ultraviolet light of different wave-lengths.
10. A paramagnetic atom which when free obeys Curie's law, may have in the solid state its magnetism quenched.
11. Actually there are more industrial machine parts that have their dimensions determined on the basis of stiffness rather than on strength requirements.
12. With presently available thermodynamic data, it has been verified that a large group of metals of interest (Mg, Li, Be, Al, Zr and Si) have their combustion temperature limited as described.
13. In 1843 Hoffman obtained a mercury compound from aniline and mercuric chloride. To this day it is not certainly known whether this product had mercury attached to nitrogen or to carbon.
14. The only way in which a commercially pure metal may have its properties altered is by means of cold deformation and control of the annealing operation that may follow the cold working.
15. If it were possible to have the interior of an ingot cooled simultaneously with the exterior, the results of shrinkage would be of little consequence.

16. For a thin target the cathode electrons do not have their direction of motion altered before they suffer a collision resulting in radiation.
17. A considerable number of enzymes has been found to have their activity increased by the addition of various substances.
18. Under the tsars Radischchev's works were suppressed. His "Journey" was under ban up to the 1905 revolution. Before this Herten had it republished abroad in 1858.

XI. СВОДНЫЕ ПРИМЕРЫ НА ВСЕ СЛУЧАИ ТРУДНОСТЕЙ

1. Since electron capture may be thought of as an inverse beta-process, one might inquire if there are other inverse processes.
2. In the chapter on current economic problems, we are given a good insight into many of the special problems that have to be involved.
3. The reader is advised to review the principles of nucleus-particle interactions given there before proceeding to the discussion of experimental facts given below.
4. Covalent compounds are frequently spoken of as non-polar as compared to electrovalent compounds and the latter are said to be polar because they are composed of distinct positive and negative parts.
5. After a certain period the bacterial population in sea water will rapidly drop off in numbers no matter how high the numbers become and no matter how the increase is brought about, it is soon followed by a rapid drop, due to autolytic processes and activities of the animal population.
6. Janus was one of the gods of the early Italian mythology. He is thought of as connected with the door or gate, and he is sometimes pictured as holding a key. In statues he is represented with two faces one in front and one behind, to typify the power of seeing forward and backward at the same time.
7. The question whether the atom can or cannot be split up is known to have interested scientists from ancient times.
8. An analysis is said to be complete or partial depending on whether all or only a part of the constituents are determined.

9. In 1843 Hoffman obtained a mercury compound from aniline and mercuric chloride. To this day it is not certainly known whether this product had mercury attached to nitrogen or to carbon.
10. It is still uncertain whether the variation in energy of the electrons can be wholly accounted for by energy losses during their passage through the material, or whether their initial energies differ. The former would seem more probable on theoretical grounds.
11. Because chemistry is an experimental science, the correct procedure must be to see if the formulas do apply and then to classify the systems on the basis of their behaviour.
12. Even after many years of research, it is far from easy for science to give a definite opinion on the important question as to whether or not modern intensive fishery operations are affecting the composition of the stock of edible fish in the sea.
13. It is doubtful whether definite conclusions can be drawn from these data, as quite a number of assumptions have to be made for the calculations of the absorption spectra. A kinetic approach might prove fruitful in connection with problems of this nature.
14. We shall assume that the systems being considered have low nuclear charges.
15. Success of Russian versification was due less to Trediakovsky's theoretical treatise and to the early practical experiments of Trediakovsky than to the brilliant practical writings of his contemporary Michael Lomonosov (1711—65). One may even wonder if the second treatise would have received its final shape without the convincing example set by Lomonosov's verse.
16. The very successes of physics and chemistry have ensured that biology should now present the key problems of the whole of natural science.
17. Let us assume that at the time when the spherical shape of the visible part of the moon was discovered, there was a school of philosophers who insisted that you have always to make the simplest assumption and that a plane is the simplest surface. Then the astronomers would have declared that the moon is a hemisphere with a plane back, which would have been in perfect agreement with the then available observations.

18. It would be a mistake to believe that the fission itself, that is, the splitting of a heavy nucleus into two nearly equal parts, could contribute to the progressive nuclear reaction. What makes the fission process so important for the development of a self-sustaining nuclear reaction is the discovery that before being finally slowed down each fission fragment emits a neutron.
19. If the vapors emitted were collected, they would be found to consist largely of water.
20. It is apparent from the previous discussion that only a few of the thermometers mentioned would be suitable for field tests.
21. In order that the inductance be independent of the current, it is necessary that no magnetic materials be used in the coil construction.
22. It is theoretically possible that a part of the nuclear energy might be liberated by transforming either the lightest or the heaviest of the elements into others of medium weight.
23. It is of some interest to see what would have resulted if CH_3 did not have a threefold axis.
24. The radio frequency has to be chosen such that its period equals the time it takes for the ions to make one revolution.
25. The expression spectrophotometry would be needed in the case of apparatus that use the principle of selecting wave length, even if only by coloured filters.
26. Virtually every organic solid, and some liquids, to which a pair of electrodes could be attached seem to have been studied at one time or another.
27. As might be expected, there are intermediate reactions in which two ionic mechanisms appear to be taking place simultaneously.
28. Biology now touches the physical sciences at so many points that it would be difficult for anyone who has worked in the latter not to have had some practical contacts with biological topics.
29. It might be thought that the heat of a reaction is its driving force, and that a reaction will proceed if it evolves heat, and not proceed if it absorbs heat.
30. In conclusion, I should like to remind the reader once again that polymer chemistry is a very large subject and one which is growing rapidly. It is obvious that a

- detailed and comprehensive treatment of this subject would be beyond the scope of a single contributor.
31. The diesel locomotive is a much more complicated machine than the steam locomotive and, as one might expect, the control of its speed and power is a much more complicated operation than the relatively simple control of a steam locomotive.
 32. A few fields of mathematical research do sometimes entail long and tedious manipulations which should be amenable to machine treatment.
 33. When magnetizing, say, a piece of steel by using a magnet to rub it, we should rub the steel always in the same direction.
 34. The reader should not expect to be given a complete account of measuring techniques such as he would find in an inclusive textbook on the subject.
 35. For precision of analyses it is necessary that the calibration coefficient should be carefully determined with optimum accuracy.
 36. When in doubt as to the safe working voltage of a transformer, the best test is a corona test.
 37. Since antimony hydroxide is a very weak base, we should expect its salts to be decomposed, if hydrolized by water.
 38. There are some 65 transistor parameters which can be measured for a complete evaluation study. Fortunately, only a few need be measured to determine if a transistor's characteristics have changed markedly from those it should have.
 39. Theoretical calculations based simply on forces acting between the atoms in an ideal solid indicate that the stresses required for fracture should be as much as 100 to 1000 times as large as that actually observed.
 40. It would be expected that the antarctic convergence would move northwards as the speed of surface currents increases.
 41. The scope of the geophysical studies to be undertaken is to be extended.
 42. For a system to be in complete equilibrium, it is necessary that there be mechanical equilibrium.
 43. Metallic aluminium seems not to be acted upon by air or water, or many other chemical agencies.

44. The great French naturalist Risso, who worked at Nice, seems to have been the first to recognize a deep sea fish fauna.
45. The evidence of particular groups of birds supposed to have originated in tropical North America seems to have been misinterpreted.
46. On theoretical grounds one would expect the minimum frequency for ionization to be connected with the ionization potential, as found by Frame and Hertz's method or from spectral considerations.
47. There does seem to be some confusion in the literature as to the nomenclature of various hydrogen chromospheric structures.
48. The problem of correlating reaction velocity with solvent composition is well known to be difficult and is still far from being solved even in systems where only one chemical change is taking place.
49. We know the transformer to be a device designed for changing the alternating current voltage by means of magnetic induction, the frequency remaining unchanged.
50. With a pure liquid the only way concentration could increase at the interface would be by a compression of the molecules: an increase in the number of molecules per unit volume of the liquid, and this does not seem to occur.
51. To those whose sole interest in the organism is to analyze it as a physicochemical machine, the question of the historical origin of this machine would seem to be a matter of quite minor importance.
52. We have gone as far as this without yet mentioning the second type of nuclear transformation known to be the process of «beta-decay», and to consist of the emission by the nucleus of an ordinary negative, or a positive electron.
53. In higher latitudes the breezes are irregular, and usually so light when they do occur, that they pass unnoticed save by the trained observer.
54. The functions considered differ from the hydrogen-like functions in not having the principal quantum number occur in the exponent.
55. From information available we may presume, that the majority of the Ceratioid ¹ species will be found di-

¹ ceratioid — разновидность морских животных.

- distributed in all the oceans and that species hardly occur with a distribution restricted to the Atlantic Ocean.
56. It is a public health problem which will be with us for centuries to come, and unless every effort is made now to develop methods for disposing of radioactive wastes in the future, nuclear power may present hazard far outweighing its value as an energy source.
57. We could go on indefinitely discussing the physical foundation of the gene theory, in particular the important evidence supplied by the study of mutations produced by X-rays and other radiation, but what has already been said appears to be sufficient to convince the reader of the fact that science is at present crossing the threshold of the purely physical explanation of the «mysterious» phenomenon of life.
58. Wherever motion exists friction is always acting in a sense opposed to the motion, although in many cases its very presence is essential for the motion to take place. Thus it would be quite impossible to walk were it not for the friction between one's feet and the earth, a train could not run were there no friction between the wheels and rails, and a belt would be of no use in transmitting power if there were no friction between the belt and pulley. Friction, therefore, acts as a resistance to motion and yet without it many motions would be impossible.
59. While going up the river we noticed a number of new currents but knew this section of the river to be deep enough unless a gravel bar had formed.
60. The region in the vicinity and to the west of the Galapagos Island is known to be abundant in marine life, but observations are not detailed enough to show whether two maxima of abundance of marine life occur, related to the two divergences.
61. The Egyptians in nearly all periods of their history seem to have been very fond of making written records, or of constructing permanent monuments of some kind which would preserve their memory to aftertimes.
62. One might expect that the deeper the water the longer will be the time for the remains of organisms from the upper more productive layer to sink to the deep-sea floor and thus the greater should be their destruction by bacterial activity.

63. Napoleon, who had never known what is meant to retreat, in October 1812 began to withdraw from Moscow. When he left the capital he ordered the Kremlin to be blown up, and it was only by mere chance that this great national monument was saved from destruction.
64. It had been observed by the ancients, the Babylonians, the Egyptians, and others, that the big planets like Saturn or Yupiter seemed to move across the sky in a rather peculiar way. They seemed to proceed along an ellipse in the way the sun does, then suddenly to stop, to back, and after a second reversal of motion, to continue their way in the original direction.
65. The illimitable range of linguistic diffusion requires us to question whether a word can ever have just one meaning.
66. The legendary giant Atlas was, according to a Greek legend, supposed to have lived in the regions around what is now known as the straits of Gibraltar, hence the name Atlantic which was given to waters adjacent to this strait and especially those to the west.
67. There is no known reaction suspected of its having a molecularity greater than three.
68. In the winddriven ship with no sails the forward motion is brought about by having a steam engine rotate two vertical cylinders.
69. There do not seem to have been any determinations made of the rate of recombination of electrons with positive ions, and for most gases these would be very difficult owing to the electron uniting with an uncharged molecule and becoming for a time a negative ion.
70. An electron emitted from the filament should not go to either end of the ion chamber. A magnetic field parallel to the axis prevents the high-velocity electrons from reaching the wall without first colliding with particles in the ion chamber.
71. During the last half century the question of multiple primary malignant neoplasms¹ has undergone a metamorphosis from being a rare medical curiosity to being a commonplace medical problem one that is worthy to study not only because of its own intrinsic significance but also because it offers a new avenue of approach to the over-all study of tumors.

¹ malignant neoplasms — злокачественное новообразование.

72. In 1739 the Geographical Department of the Academy of Sciences was founded, an active part in its work being taken by the great Russian scientist Michael Lomonosov.
73. One can think of the atom as having been constructed stepwise, as if electrons were added one by one to fill each energy level, the process starting with the lowest and continuing until the excess positive charge of the nucleus was neutralized.
74. The silicon in the oceans is derived mainly from the silicates of the earth's crust, which, it has been suggested (Sillen, 1961) may have determined the ionic composition of sea water, soluble silicates having exerted a buffering action and insoluble ones having acted through their ion-exchange capacity.
75. In this investigation we have assumed that the maximum coordination number of copper (II) ion is 4, and have used the method developed by Professor G. Scatchard for the evaluation of $\log K_1$ and $\log K_4$, this procedure having been shown to be considerably shorter and simpler than Bjerrum method of successive approximations.
76. It is the magnetic moment that would be ascribed to a proton if it could be treated as a spinning spherical particle with its charge distributed uniformly over the surface.
77. It was in the course of a systematic attempts to see if any radiation could be produced which would traverse matter opaque to ordinary light that Roentgen discovered the x-rays.
78. Britain's greatest single source of wealth is coal; it was this abundance of fuel which made it possible for her to take full advantage of the industrial revolution.
79. It was Clausius who in 1857 establishes the kinetic theory of matter according to which molecules are in constant motion, the motion itself being heat and their velocity being dependent on the temperature.
80. It is obvious that it is the mass-ratio which, other things being equal, determines the altitude to which a rocket can ascend. If you have two rockets of the same weight when fully fueled and alike in every respect but for the fact that one can hold more fuel than the other, that second rocket will have a longer burning time and consequently rise longer and higher.

81. To give an adequate yet brief account of the influence of the biological sciences in the twentieth century is a far more difficult task than that attempted for the physical sciences. Yet it is essential to discuss them, for it is in the twentieth century that biology, as a working and usable science, first begins to come into its own.
82. Of particular relevance to the work to be described here is the paper of Hubbard and Johnson.
83. Presented here is a single case of fatal homotransplanted melanoma, which we believe is the first of its kind to be reported.
84. More significant is the failure to resolve the K and L groups of electrons in the case of argon.
85. Crawling over the deep-sea floor are a number of invertebrates, chiefly crabs.
86. Most baffling was the existence of isomers; e. g., the compound $\text{CoCl}_3 \cdot 4\text{NH}_3$ could exist in two forms, a violet one and a green one. .
87. Hardly had the constitution of Athens assumed its democratic form when the state was called upon to take a foremost part in the desperate struggle of the European Greeks to keep themselves from absorption in the great Oriental empire of the Persians which had been created by Cyrus and successors.
88. Hardly ever did scenic designers endeavour up to 1750 to provide a proper historical setting for plays of the past on the English stage, while the actors were content if some symbol appeared in their dress to indicate the state of life or the race they were supposed to be representing.
89. One of the methods we have of storing electricity is in an accumulator, where compared with the amount of available current the cost and space required are very great.
90. Each time a piece of magnet is broken, each fragment upon being tested with a compass is found to have a north pole on one end and a south pole on the other.
91. As we proceed with the study of chemistry we shall find that the subjects we are most concerned with are those which have to do with matter and with energy.
92. While still a youth Chernyshevsky made a study of progressive European thought. The conclusion he reached

was that force had to be applied in order to destroy the despotic tsarist rule.

93. Since oxygen plays such an important part in chemistry, we should like to stick to it as our standard, while keeping the weights of all other molecules above unity.
94. We do not know where the boundary of the tropical zone should be drawn, nor do we know whether there is in fact any definite border or transitional zone or whether the transition is gradual and uniform
95. The case we have considered is the one which gives the greatest chance for the mobility of the ion to be independent of its nature; we have seen, however, that even in this case there would be much greater variations in the mobility than are consistent with the experiments.
96. Peter Chaikovsky entered the St. Petersburg Conservatory at the age of 22, in 1862. Three years later he graduated with a Silver Medal for a cantata he composed, and the following year was offered a professorship in the Moscow Conservatory.
97. The simplest explanation for the difference between the sediments of the Atlantic and the Pacific would be to state that the ratio of calcium carbonate to noncalcareous material is different in the waters carried to the two oceans.
98. When taken from the water, a Puffer will generally inflate at once, but if slow to begin can be persuaded to swell up by gentle tickling.
99. Primary tropical forests are supposed to have been little, if at all, affected by man and are believed to have existed much as they are now from a very remote period.
100. In measuring high pressures it is necessary to use some form of pressure gage. Such gages usually contain some elastic element which, when deformed by the pressure, has its motion transmitted by a mechanism to a pointer of dial.
101. Typological development in archeology carries more weight when supported by the evidence of associated finds.
102. The chronology of the European Bronze Age has been built up almost entirely on a study of associated finds or hoards¹. Objects found in hoards which represent

¹ hoard — сокровищница.

the equipment of an individual, whether buried for safety during his lifetime or placed with him, as grave-goods for use in the next world, are likely to be in contemporaneous use.

103. From the remotest beginnings of painting as far back as one cares to go, artists have been occupied with the facts of life, with faces, figures, scenes and events—things accessible to the eye — but never, when men of brains and beliefs, have they treated these facts as isolated fragments to be mechanically recorded in the manner of the camera.
104. Electricity supplied by a solar power station is likely to be much cheaper than that produced by burning coal or oil.
105. The first problem we shall investigate is that of calculating the chance of the electron passing over a distance X parallel to the electric force without becoming attached to a molecule.
106. Of all the many theories of atomic structure that have been presented, the experiments pick out that supplied by the new quantum mechanics as the only one which is adequate to account for the observations.
107. Whatever their individual development, the Russian symbolists remained faithful to their essential principle—that of being in close contact with European culture.
108. The greater the stability, i. e. the lower the energy content to be expected of a contributing structure, the greater will be its contribution to the total structure of the hybrid.
109. The smaller the coal the more ash is likely to be present unless the slacks are washed to remove the major portion of ash, when required for manufacturing into coke.
110. Many materials are suitable insulators (dielectrics) and it might appear that the higher the dielectric constants the more suitable the material.
111. In general, the greater the concentration of oxygen by reason of pressure, of purity, or of both, the more readily the material would oxidize.
112. Whatever the nature of the metal may be, the slower the rate of cooling the larger will be the size of the crystals after solidification.
113. Taking photographs of such small objects as atoms and molecules, one has to take into account the fact

that nothing will come out at all unless the wave length of illuminating light is smaller than the size of the object to be photographed.

114. Only after the famous around-the-world sailing of Fernando de Magellan did the last doubt about spherical shape of the Earth finally disappear.
115. With so few specimens available, one can only speculate on what relation the known distribution of angler-fish does, in fact, bear to the great ocean currents, north and south.
116. Nitric acid, the most important of the oxyacids, does not occur free in nature, but its salts are to be found in all fertile soils.
117. A further very interesting difference between submarine basalts and those of subaerial origin is to be found in the radium content.
118. Where operation is to be at moderately high temperatures, silicon transistors could be used.
119. The purpose of this chapter is to describe the characteristics of solid pure metals and to explain how they behave when subjected to the action of mechanical forces under different conditions of time and temperature.
120. It would be one of the romances of science if these obscure and prosaic minute leakages of electricity from wellinsulated bodies should be the means by which the most fundamental problems in the evolution of the cosmos had to be investigated.

**ВЫБОРОЧНЫЙ КОНТРОЛЬНЫЙ
ПЕРЕВОД ПРИМЕРОВ**

**I. ПАССИВНАЯ КОНСТРУКЦИЯ
С НЕКОТОРЫМИ ГЛАГОЛАМИ**

1. О магнетизме упоминается в древнейших памятниках письменности, созданных человеком.
6. За качественным исследованием органического соединения следует количественный анализ.
9. На заряд атома не влияет число присутствующих в нем нейтронов; он зависит от равновесия между электронами и протонами.
11. Когда на молекулы даже хорошего изолятора воздействует электрическое поле, то существует движение электронов, обусловленное наличием этого поля.
13. На использование металлов влияют имеющиеся запасы руды, стоимость добычи и очистки, а также и то, каким образом они могут быть выгодно использованы на практике.
28. Чеховым восхищаются во всем мире и, в первую очередь, в Советском Союзе. Его почти всюду считают величайшим русским писателем, величайшим новеллистом и драматургом современности.
30. В литературе классицизма простого человека считали неспособным к тем высоким страстям, которые вызывают восхищение и «трагическое» сострадание, и его можно было рассматривать только как объект развлечения и насмешки.
31. Прометей продолжает жить и в наше время как идеал бескорыстия. Он представляется нам человеком, который не колеблясь, переносил огромные страдания в стремлении сделать добро людям.
32. Идея социализма появилась и проникла в сознание людей в современном обществе из-за их непримиримости.

мого отношения к злу, которое влечет за собой капитализм, и убеждения в том, что только путем радикального преобразования всего экономического базиса можно уничтожить это зло.

33. Наиболее значительный водный путь во Франции — это река Сена, которая углублена посредством каналов и приспособлена для судов с водоизмещением примерно в 1000 тонн, идущих до самого Парижа. Ниже Руана могут проходить еще более крупные суда.

II. КОСВЕННЫЙ ВОПРОС, ВВОДИМЫЙ СОЮЗАМИ WHETHER ИЛИ IF

1. Для того, чтобы определить, является ли данное соединение органическим, часто бывает достаточно нагреть его.
2. Электроскоп можно использовать, чтобы определить (сказать), заряжено ли тело положительно или отрицательно.
3. Некоторые элементы обладают такими малочисленными металлическими свойствами, что неясно, следует ли называть их металлами или не металлами.
5. Возникает вопрос, являются ли все породы естественными соединениями минеральных веществ.
16. Необходимо знать — могут ли или не могут молекулы продолжать свободно вращаться в кристалле при самых низких температурах, при которых измеряется его удельное тепло.
19. Еще не установлено, следует ли нам рассматривать долмены Северной Франции как произведения одного и того же народа, или отнести их к различным народам — народам разных национальностей и разных эпох.
20. Размышляя о скрытой природе вещей, греческий философ Демокрит столкнулся с проблемой структуры материи, и перед ним встал вопрос о том, может ли она существовать в бесконечно малых количествах.

III. Сослагательное наклонение

Простые предложения

4. Потребовалось бы много страниц, чтобы суммировать данные этой огромной работы.
9. Изложение лекции было бы неполным (изложение данной лекции было бы неполным) без упоминания ядерных частиц, известных в настоящее время как «мезоны».

Сложносочиненные предложения

1. Мне хотелось бы начать с общего описания метаболизма, а затем я перейду к обсуждению общей биохимии мелких организмов, таких как бактерии и дрожжи.
5. Любой химик был бы рад, если бы ему удалось создать хотя бы даже простейшую разновидность углевода из углерода и воды, но даже сама природа не в состоянии этого сделать.
6. Термин «твердый раствор» на первый взгляд мог бы показаться противоречивым, но только потому, что большинство известных нам растворов жидкие, и термин «раствор» в понимании многих людей синонимичен слову «жидкость».
9. Сибирь — это территория таких гигантских размеров, что поражает воображение. Почти вся Европа или Соединенные Штаты вместе с Аляской могли бы поместиться в ее пределах.

Придаточные предложения подлежащие

1. Необходимо, чтобы предварительная реакция была в основном законченной.
3. Необходимо, чтобы пластинки конденсатора были хорошо изолированы друг от друга.
6. Необязательно, чтобы имелась только одна валентная связь, удерживающая вместе два углеродных атома. В некоторых случаях их может быть две или даже три.
7. Важно, чтобы вы знали отличительные особенности звезд и планет не только по их внешнему виду, но и по значительному различию в их состоянии.

Придаточные предложения — предикативные члены

1. Основное требование к методу осаждения состоит в том, чтобы полимер не был растворим в мономере.
4. Первое требование, предъявляемое к хорошей системе классификации, состоит в том, чтобы она была объективной и (легко) воспроизводимой.
10. Наиболее актуальная задача, стоящая перед учеными в настоящее время, заключается в том, чтобы использование атомной энергии в мирных целях было расширено.

Дополнительные придаточные предложения

5. Они настаивали на том, чтобы не было недооценки огромного значения солнечных печей.
6. Было предложено, чтобы детали машин испытывались в очень жестких условиях.
11. Белинский рассматривал литературу не только как средство познания жизни, но также и как средство изменения ее, и настаивал на том, чтобы писатели распространяли прогрессивные идеи.

Определительные придаточные предложения

2. Использование усиления делает возможным удовлетворительный прием сигналов волн, которые в противном случае были бы слишком слабыми, чтобы давать слышимый ответ.
3. Одним из тех металлов, в которых ниобий мог бы быть ценным элементом сплава, является титан.
9. В астрономии принято говорить об очень больших расстояниях, определяя время, за которое их мог бы пройти свет, который распространяется с огромной скоростью в 300.000 км в секунду.
12. Ток тотчас же повышается до той величины, которую он имел бы, если бы переключатель был замкнут несколько ранее.

Обстоятельственные придаточные предложения цели

1. Инструменты были тщательно упакованы, чтобы их не повредить во время транспортировки.
4. При экспериментировании с легковоспламеняющимися веществами нужно следить, чтобы температура не становилась слишком высокой.
5. Во время войны производство некоторых товаров широкого потребления было прекращено в нашей стране, чтобы освободить (чтобы можно было освободить) рабочую силу и материалы для использования их в военных целях.
6. Все компоненты водяных турбин должны быть сконструированы так, чтобы избежать кавитации (чтобы обеспечить отсутствие кавитации).

Условные придаточные предложения

2. Если мы сравним два проводника из одинакового материала, но разных размеров, то найдем, что сопротивления их различны (что они обладают разным сопротивлением).
3. Если бы одну каплю воды увеличить до размеров земного шара, то каждая молекула, содержащаяся в ней, была бы не больше футбольного мяча.
6. Что произошло бы, если бы весь воздух можно было вытеснить из комнаты?
7. Развитие авиации, работающей на ядерном горючем, было бы значительно проще, если бы не серьезная проблема радиоактивности.
11. Если бы можно было добиться, чтобы любой ядерный процесс давал более одного эффективного нейтрона на один первоначальный нейтрон, то реакция протекала бы все быстрее и быстрее.

Придаточные предложения образа действия

1. Поскольку металл в центре печи горячее, чем металл у ее стенок, он находится в постоянном движении, как если бы кипел.
2. Позднейшие достижения в области физики показали, что, строго говоря, нельзя рассматривать электрон так, как если бы он двигался по орбите относительно молекулы.
3. Общий вес тела действует так, как если бы он был сосредоточен в одной точке, и эта точка называется центром тяжести.
6. Можно представить себе, что атом создавался постепенно, как если бы электроны добавлялись один за другим, заполняя каждый энергетический уровень.
8. H_2 довольно легко горит в присутствии NO_2 , но пламена, по-видимому, имеют значительно более низкую температуру, чем можно было бы ожидать при полном сгорании.

Уступительные придаточные предложения

1. Потенциал на многих золотых электродах едва ли меняется, независимо от того, пробулькивается ли раствор воздухом, водородом или азотом.
2. Хотя одновременно могло бы происходить большое количество различных химических реакций, мы ограничимся одной изолированной реакцией.
4. В какое бы положение ни был установлен компас, найдено, что отклонение (его стрелки) зависит от положения проводника по отношению к компасу.
7. Какова бы ни была форма различных частей сосуда, жидкость, которую он содержит, всегда находится на одном и том же уровне (за исключением капиллярных трубок).

Придаточные предложения причины

1. Кислород — чрезвычайно важный для нас элемент, так как все живое погибло бы без него.
4. Без природных полимеров человек и его мир не могли бы существовать, так как пища, которую мы едим, да и самые мышцы нашего тела — полимеры. Без ис-

кусственных полимеров наша современная техника была бы отброшена на много десятилетий назад.

5. Легко понять, почему астрономы очень хотели знать правду о свете, так как наблюдения за двумя звездами могли бы оказаться совершенно неверными, если бы передача света не была бы мгновенной.

Общее повторение сослагательного наклонения

1. Нам хотелось бы знать, какое число служит для выражения скорости обмена, т. е. сколько тепла мы получаем из данного количества механической энергии.
3. Было бы неправильно говорить, что рентгеновские лучи стали доступны человечеству в результате случайности.
4. То, что было бы высокой температурой в одном случае (например, при коксировании угля), можно было бы рассматривать как очень низкую температуру, говоря о внутренней области какой-либо звезды.
9. Элементарные структурные частицы живой материи обычно известны под названием «клеток»; их можно было бы также назвать «биологическими атомами» (т. е. «неделимыми») в том смысле, что биологические свойства данного типа ткани сохраняются только до тех пор, пока она содержит по крайней мере одну отдельную клетку.
10. Факт неустойчивости тяжелых ядер проливает свет на вопрос о том, почему имеется только 92 элемента в природе; фактически любое ядро более тяжелое, чем уран, не могло бы существовать какой-либо период времени и немедленно распалось бы на более мелкие фрагменты.
21. Есть много свойств, которые можно было бы принять за критерий существования ферромагнетизма, но было бы трудно дать определение, которое было бы и полезным, и точным.
23. Для того, чтобы индукция не зависела от тока, необходимо, чтобы никакие магнитные материалы не использовались в конструкции катушки.
24. Свойства плутония обязывают к тому, чтобы он содержался в закрытых, воздухонепроницаемых и огнеупорных сосудах, в которых поддерживается небольшое отрицательное давление по отношению к окружающей среде.

25. Советский Союз рассматривал техническую помощь, оказываемую демократическим странам, как комплекс мероприятий, направленных на то, чтобы в будущем каждая из стран, получающих эту помощь, могла проводить свои собственные исследования в направлении мирного использования атомной энергии, независимо от какой-либо другой страны.
30. Если вы вспомните, что ядерная энергия, содержащаяся в одном фунте урана, эквивалентна энергии десяти тонн угля, вы поймете, что возможность освобождения этой энергии привела бы к очень важным изменениям в нашей экономике.
31. Кинетическая энергия, которой обладает падающая вода, может быть преобразована в электричество. Если бы нам пришлось подробно изучать такие преобразования, то мы бы обнаружили, что определенное количество энергии одного рода всегда дает определенное, эквивалентное количество энергии другого рода.
45. Единственная трудность китайского разговорного языка, независимо от диалекта, заключается в «тонах» (различных интонациях одного и того же звука, которые придают ему различные значения). Если бы не эти тона, китайский разговорный язык был бы очень легким.
50. Пчела — насекомое. Это означает, что ее тело выглядит так, как если бы оно было разрезано на две части. Слово *insect* означает «разрезанный».
51. Ходили слухи об исключительной силе Леонардо да Винчи: о том, что он мог сгибать подкову так, как если бы это было свинцовое кольцо.
52. Люди часто говорят о китайском языке так, как будто это единый язык, на котором более или менее одинаково говорят во всем Китае. В действительности же разговорный язык подразделяется по крайней мере на восемь диалектов, настолько отличающихся друг от друга, что образуют восемь языков, таких же разных на слух, как английский, голландский и немецкий.
54. Энергию можно было бы передавать на большие расстояния посредством серии трансмиссий, но потери, обусловленные трением и другими причинами, были бы такими большими, что осталась бы только небольшая часть полезной энергии (для использования).

57. Без надлежащего знакомства с классическими мифами нельзя было бы ни наслаждаться картинными галереями, ни понимать некоторых картин. Более того, не зная хотя бы немного об этих мифах, нельзя было бы полностью оценить внешнее декоративное убранство на фасадах зданий и уж во всяком случае разобраться в скульптурах, которые мы видим в больших садах и парках.

IV. НЕКОТОРЫЕ СЛУЧАИ УПОТРЕБЛЕНИЯ ГЛАГОЛА SHOULD

Should в значении долженствования

1. Изучение современных экономических проблем дает нам представление о том, чего нам следует ожидать в будущем.
5. Смесь из двух веществ должна стоять возможно более короткое время и ее не следует подвергать действию света, в противном случае произойдет немедленное разложение одного из веществ.
7. Ни одно вещество нельзя считать совершенно нерастворимым.
12. Определение структуры плазмы должно включать описание изменений в пространстве и времени электрических и магнитных полей и плотности тока, а также пределы параметров, для которых существуют эти конфигурации.
14. Стремление Маяковского заранее определить ритм, в котором следует читать его стихи, вполне понятно.

Should — в качестве вспомогательного глагола для образования аналитической формы сослагательного наклонения

1. В заключение мне еще раз хотелось бы напомнить читателю, что «Записки из мертвого дома» — это введение к большим романам Достоевского. В «Записках» Достоевский развил философию романа «Преступление и наказание».
4. Всем конструкторам оборудования для работы в условиях низких температур, рекомендуется использовать все требуемые свойства гелия.

6. Если в реакции участвует больше одного вещества, нет необходимости в том, чтобы все они имели одинаковую начальную концентрацию.
9. В случае, если не будет дождя, посевы будут повреждены.
10. Если бы подача смазки приостановилась даже на короткое время, то могло бы произойти серьезное повреждение.

Эмоциональное употребление should

1. Вполне естественно, что столкновения между атомами происходят часто и что они имеют большое значение для многих явлений.
5. Вызывает некоторое удивление то, что в тяжелых ядрах существует оболочечная структура, так как взаимодействие между соседними ядерными частицами, несомненно, должно быть очень сильным.
6. Так как Северная Америка — вторая по величине страна в северных широтах, то вполне естественно, что там существует диапазон температур, по своему масштабу уступающий только Азии.
7. Нет ничего удивительного в том, что такая личность как Леонардо, так быстро стала легендарной.
8. Может показаться странным, что осколкам небесных тел, которые иногда попадают на землю, придают такое большое значение при обсуждении их химической природы, но некоторые особенности, присущие метеоритам, указывают на их тесную генетическую связь с солнечной системой.
12. Мы не знаем в чем причина этого, относительно позднего, формирования лимфатической ткани у этих двух основных групп теплокровных позвоночных.

V. НЕКОТОРЫЕ СЛУЧАИ УПОТРЕБЛЕНИЯ ГЛАГОЛА WOULD

Would для выражения повторного действия

7. Циклический прибор, который непрерывно выделяет тепло из одного резервуара и полностью превращает тепло в механическую работу, называют постоянным двигателем второго типа.
8. Однако, не следует забывать, что тогда как большинство химических реакций легко происходит при темпера-

туре в несколько сот градусов, соответствующие ядерные преобразования даже и не начинаются, прежде чем температура не достигнет многих миллионов градусов.

**Would в качестве вспомогательного глагола
для образования аналитической формы
сослагательного наклонения**

2. В принципе гораздо более полная информация о природе материала может быть получена на основе анализа образцов монокристаллов. Одного этого было бы достаточно для объяснения того, почему при современных исследованиях все больше и больше используются монокристаллы.
8. Как можно было бы ожидать исходя из меньшей массы электрона, пробег электрона с данной энергией значительно больше, чем пробег тяжелых частиц.
9. Если бы испускаемые пары были собраны, то нашли бы, что они состоят, главным образом, из воды.

**Would в качестве вспомогательного глагола
для образования Future in the Past**

3. Был затронут вопрос о том, обеспечат ли глубинные воды Тихого океана более длительный период изоляции радиоактивных отходов, чем какое-либо другое место, поэтому океанографические данные глубинных слоев Тихого океана должны быть тщательно изучены.

VI. НЕЛИЧНЫЕ ФОРМЫ ГЛАГОЛА

Инфинитив

Инфинитив в функции определения

1. Конденсатор — это прибор для накопления электрических зарядов.
2. Янтарь, стекло и сургуч относятся к числу веществ, которые легко электризуются трением.
5. Проблема, которую следует разрешить на данном этапе, — исключительно геометрическая.
6. Процесс, который будет рассмотрен в дальнейшем более детально, называется ионизацией (известен под названием ионизация).
7. Существует много методов для измерения магнитной чувствительности. Выбор метода зависит от изучаемой проблемы.
8. Постоянные поиски материалов для замены или пополнения редких металлов побуждают уделять больше внимания этой новой области.
11. Первым математиком, исследовавшим природу сопротивления твердых тел на разрыв, был Галилей.
16. Существует большое расхождение во мнениях относительно максимальной практически достижимой космической скорости. При определении космической скорости необходимо принять во внимание целый ряд соображений.
19. Советский Союз — первое социалистическое государство, которое считает, что все нации равны.
21. Канада, первая из британских заморских территорий, получивших самоуправление, является сейчас также и наиболее высокоразвитой.

Оборот «именительный падеж с инфинитивом»

2. Известно, что ядра всех атомов состоят из протонов и нейтронов.
4. Минералы, образующие твердые растворы, называют изоморфными.
5. Было доказано, что атмосфера простирается на несколько сотен километров над землей.
8. Предполагается, что диаметр солнца равен, примерно, 1.391.000 километров; следовательно оно в несколько тысяч раз больше земли.

10. Полагают, что ни один материал не является совершенно упругим даже при очень малом напряжении.
11. Известно, что в самых ранних приборах для сравнения температур используется изменение объема ограниченной по объему жидкости в процессе ее нагревания.
14. Есть кристаллы, у которых, по-видимому, имеется два типа внутриаомного притяжения, действующих одновременно.
44. Металлы, которые, как известно, существуют в более чем одной кристаллической форме, это — кобальт, церий, олово, марганец, хром, таллий.
52. Сообщалось, что солнечные установки существуют во многих странах. Некоторые из таких установок, по-видимому, используются, главным образом, для экспериментальных целей.
56. Известно (говорят), что паровая турбина, в ее примитивной форме применялась много столетий тому назад, но превращение ее в действительно целесообразную форму основного типа двигателя произошло лишь в течение последних 50 лет.
70. Оказывается, что сравнительно небольшое число элементов встречается в природе в несвязанном виде; большинство из них встречается в виде химических соединений.
73. Многие предложения относительно изменения традиционных методов накопления и поисков информации были сделаны за последнее десятилетие, и оказалось, что некоторые из них уже имеют значительную практическую ценность.
76. В случае слабых магнитов магнитное поле настолько слабое, что можно считать, что действие его ограничено лишь небольшим пространством вблизи магнита.
79. Обычно считают, что уголь образовался в земле под длительным воздействием геологических сил и благоприятных биологических условий при накоплении растительной среды под водой.
81. До сих пор не найдено никакого способа получить искусственным путем космические лучи; в самом деле, поскольку они обладают напряжением энергии в тысячи миллионов вольт, пока что вряд ли возможно создать их с помощью электроэнергии на земле.
84. Некоторые из древних ученых считали, что материя

- состоит из атомов. И все же, едва ли можно сказать, что они сформулировали подлинно научную теорию.
86. Высшим расцветом цивилизации древнего Египта был, по-видимому, период Средней Империи.
87. Индии, по-видимому, с давних пор были известны сталь и железо.
89. Египтяне почти во все периоды своей истории, по-видимому, любили писать летописи или сооружать монументальные памятники того или иного рода, которые могли бы сохранить память о них потомству.
91. Установлено, что даже самые примитивные племена имеют хорошо развитые языки, основанные на выражении понятий, которые не всегда могут вполне соответствовать системе представлений, известных нам из нашего языка, и которые характеризуют другие языки индоевропейской группы.
97. Китайские иероглифы, которые, как известно, употреблялись в течение последних трех тысяч лет, первоначально представляли собой примитивные рисунки, такие как изображения людей, птиц, лошадей, собак, домов, числительных (один, два, три, четыре) и т. д., и до сих пор все еще возможно проследить в видоизмененных современных формах этих иероглифов поразительное порой сходство с подразумеваемыми предметами.
98. По-видимому, жанр детективного романа не пустил глубоких корней в русской литературе и не дал ни одного русского классика в этой области.

Оборот «объектный падеж с инфинитивом»

1. В древние времена люди считали, что земля плоская.
4. При тщательном исследовании куска гранита мы находим, что он состоит из нескольких видов минералов, имеющих различную степень твердости, различный цвет и вообще различные свойства.
5. Мы знаем, что первые центральные электростанции были построены для обеспечения электрическим светом.
16. Рентгеновские лучи оказали большую помощь инженеру, дав ему возможность работать, опираясь на знания, а не на чисто практические навыки.

29. Чехов считал себя простым и последовательным реалистом и своим девизом избрал слова: «Жизнь как она есть».

Оборот «for + существительное + инфинитив»

2. Чтобы система была правильной, в ней должны быть использованы только точно установленные компоненты.
4. Время, требуемое на то, чтобы привести массу в состояние покоя, можно рассчитать без труда.
6. Стоит отметить, что водородная связь дает возможность электронам двигаться по кругу.
9. Всюду, где существует движение, трение действует в противоположном направлении, хотя во многих случаях само наличие трения существенно для того, чтобы движение имело место.
11. Для того, чтобы любое явление представить зрительно, как функцию времени, необходимо, чтобы оно было электрическим по своей природе.
13. Некоторые эксперименты доказывают, что с физической точки зрения возможно, что почвенный лед Аляски образовался в результате процесса сегрегации.
14. Время, необходимое для того, чтобы солнце совершило полный оборот вокруг центра галактики, составляет около 200 млн. лет.
27. Нашу эпоху часто называют эпохой специализации. Возможно, было бы более правильно назвать ее эпохой сверх-специализации, так как уже недостаточно, чтобы ученый специализировался в одной области науки, например, такой как геология, металлургия, химия и так далее. Даже в пределах такой ограниченной сферы технических знаний он должен выбрать узкую область, если намерен изучить ее досконально.

Perfect Infinitive после модальных глаголов

1. Большая масса центральных вод Северной Атлантики, должно быть, образовалась в северной части Атлантического океана.
3. Мел состоит из раковин мелких животных. Должно быть, они были чрезвычайно малы, так как эти раковины можно разглядеть только через очень сильное увеличительное стекло.

4. Наличие таких инородных веществ, как сера и железо, которые в разных количествах встречаются в угле, возможно, было обусловлено наличием залегающих поблизости минералов, содержащих эти элементы.
5. Хотя предложенные структуры, возможно, и не были установлены с полной определенностью, все известные факты, физические и химические, прекрасно подходят к этой остроумной интерпретации.
6. Геологи учат нас, что уголь образовался миллионы лет тому назад из огромного количества растений и деревьев. Процесс их распада, должно быть, был очень постепенным, но непрерывным.
15. Промышленное использование ядерной энергии, уже начавшееся, выводит человечество из неизбежного тупика, в который обязательно завели бы его ограниченные запасы угольного топлива.
16. Терпение кузнеца в древние времена, должно быть, было поразительным, так как сначала он сам делал сталь для самого себя медленным и утомительным способом и, возможно, терял большой процент ее во время этого процесса.
17. Мы знаем, что старые горы постепенно разрушаются под воздействием дождя, и что время от времени новые горные хребты поднимаются в результате тектонической активности; но все эти изменения все же лишь изменения твердой коры нашего земного шара. Однако, не трудно понять, что должно быть, было время, когда такой твердой коры совсем не существовало и когда наша земля представляла собой раскаленный шар из расплавленных пород.
18. Примерный подсчет скорости остывания и образования твердой коры земного шара показывает, что процесс остывания, должно быть, начался несколько миллиардов лет тому назад.
19. Для нас, людей, населяющих шесть частей света, выражение «твердая почва» практически синонимично представлению о стабильности и неизменности. Что касается нас, то нам кажется, что все знакомые нам черты поверхности Земли, ее континенты и океаны, ее горы и реки, возможно, существовали с незапамятных времен.
22. Этот эксперимент очень прост. Он не требует никакой сложной физической аппаратуры и дает нам определен-

ное представление о структуре материи. В сущности нет никакой причины, почему бы его не мог провести старик Демокрит, который был первым, кто говорил «о зернах материи», и кто, таким образом, мог бы доказать правильность своих взглядов еще тогда. Но то, что нам кажется легким сейчас, возможно не было таковым двадцать столетий тому назад.

23. Общий результат исследований накопления свинца выявляет очень важный факт: ни одна порода не обнаруживает возраста более двух миллиардов лет; отсюда мы должны заключить, что твердая кора земли, должно быть, образовалась около двух миллиардов лет тому назад из вещества, которое раньше было в расплавленном состоянии.
35. Мы почти ничего не знаем о самой ранней истории греков. Они представляли собой одно из ответвлений индоевропейского семейства, и, должно быть, отделились от основной ветви еще на самой ранней стадии своего развития. У нас нет возможности определить, когда именно они прибыли на место своего будущего жительства, но это, должно быть, было в те времена, когда Египет, а также, возможно, и другие восточные народы уже обладали высокой культурой. Мы также не знаем, каким путем попали туда греки.

Герундий и герундиальные обороты

1. Ньютон, так же, как и многие его преемники, сделал свои наиболее выдающиеся открытия, когда ему еще не было 30 лет.
3. Сырой каучук, если его не подвергать специальной обработке, не может быть использован для изготовления таких предметов, как шины, изоляция для проводов и т. д.
4. Помимо того, что автоматическое контрольное устройство способно давать более последовательные и надежные результаты, оно может также иногда употребляться в тех случаях, когда нецелесообразно ручное управление.
10. Только в середине XIX века был точно установлен тот факт, что количество произведенного тепла пропорционально проделанной работе.

16. К 1897 г. атомы четко определились, как это ни парадоксально, уже не как атомы (неделимые частицы), а как частицы, обнаружившие совершенно удивительную способность к расщеплению.
21. При современном состоянии науки ни один взрыв атомной или водородной бомбы не может быть произведен без того, чтобы не быть зарегистрированным в других странах.
23. Большое количество накопленной информации о химических и других свойствах было сведено в довольно простую и компактную таблицу, что не только дало возможность химику установить взаимосвязь между элементами, но и предсказать физическую структуру атомов, из которых состоят эти элементы.
31. Люди слышали, что картофель — замечательный «плод». Поэтому, когда вырастили первый картофель, то они собрали темные, похожие на ягоды круглые плоды, которые росли между листьями, принимая их за ту часть растения, которую можно есть.

Причастие

Причастие в функции определения

1. Физика — широкая наука, которая имеет дело главным образом с явлениями, связанными с преобразованием материи и энергии.
4. Могут применяться различные формы магнитных схем, в зависимости от используемого материала, требуемых результатов, стоимости и других факторов.
11. Следует подчеркнуть с самого начала, что нельзя написать никакого уравнения, если не известны формулы для всех реагирующих веществ и продуктов, которые образуются.
16. Слова имеют общее свойство изменять свое значение в зависимости от их применения, и используемые здесь термины не составляют исключения.

Пезависимый причастный оборот

1. Северные берега Каспийского моря замерзают каждую зиму, причем на более холодных участках лед остается примерно в течение ста дней.

2. Молекулы постоянно находятся в быстром движении, причем движение становится более быстрым с возрастанием температуры.
6. Так как инфра-красные лучи невидимы для глаза, в настоящее время изготавливаются чувствительные к ним фотопленки и фотопластины.
7. При прочих равных условиях, испарение увеличивается с повышением температуры.
12. Поскольку предварительная работа закончена, рассмотрим шесть водородных ядер, расположенных в виде правильного шестиугольника с обычными расстояниями между связями.
20. Самое глубокое и второе по величине озеро в мире Байкал находится в Сибири, причем его измеренная глубина достигает 1.741 метров.
26. Было давно известно, что все породы поразительно похожи по своему химическому составу, причем это было подтверждено последующим исследованием пород из различных частей света.
34. Коперник посвятил много времени наблюдению за планетами, уделяя внимание измерению их расстояний, и его усилия увенчались значительным успехом.
36. Британская система мер и весов получила свое развитие на основе единиц измерения, имеющих различное происхождение, причем многие из них были введены в Великобритании во времена романского завоевания.
40. В 1890 году, когда здоровье Чехова было уже подорвано туберкулезом, он предпринял трудное путешествие по Сибири до самого Сахалина, острова ссыльных, где он провел огромную работу, изучая условия жизни людей, сосланных на остров на каторжные работы.

VII. ЭМФАТИЧЕСКИЕ КОНСТРУКЦИИ

Эмфатическая конструкция *it is (was)...that (which, who)*

1. Именно сила притяжения заставляет спутники вращаться вокруг Земли.
4. Только после промышленной революции металлы начали приобретать то значение, которое они имеют сейчас.

8. Именно потребность в баллистических вычислениях больших масштабов и привела к развитию электронных счетчиков.
9. Именно исследование частиц средних размеров, которые достаточно малы, чтобы подвергаться влиянию молекулярного движения, но все же достаточно велики, чтобы их можно было обнаружить посредством сильного микроскопа, дало ученым первое прямое подтверждение кинетической теории тепла.
13. В двенадцатом веке европейцы стали свидетелями того, как первые каналы были прорыты голландцами, но только в XIV веке изобретение шлюзов в Италии привело к тому, что районы, расположенные внутри страны, стали доступны судам.
14. Именно солнце, которое отражается в каплях дождя, когда они падают, образует эти красивые цвета радуги. И именно потому, что каждая маленькая капля дождя является круглой, сама радуга имеет изогнутую или закругленную форму.
21. Наиболее важный фактор в климате пустыни — это выпадение осадков, так как именно недостаток влаги и создает пустыню.
22. Впервые освоение вод Роны (Франция) обсуждалось еще в 1911 г., но только в 1934 г. существующая программа строительства огромной плотины приобрела определенную форму.
23. Только наше поколение может осуществить то, чего не удалось добиться всем предыдущим поколениям — это поколение может не допустить войну.

Инверсия (обратный порядок слов)

а) После некоторых союзов, наречий и союзных наречий

1. Никогда ранее в электронике не существовало столь универсального и эффективного устройства как электронная лампа.
3. Вода не только действует как катализатор, но может быть также важной порообразующей составляющей.

4. Химия высокополимерных соединений лишь постепенно отделилась за последние годы и стала самостоятельной отраслью химической науки.
5. Счетно-решающее устройство может не только выполнять различного рода расчеты, но также может быстро переключаться с одного расчета на другой.
10. Как только электронные счетно-решающие устройства стали доступны для мирных целей после окончания II мировой войны, астрономы сейчас же начали использовать эту новую машину.
13. Уже давно было известно, что звук имеет отношение к колебаниям механических систем, но только после того, как Галилео Галилей (1564—1642) решил эту проблему, стало ясно, что высота звука определяется частотой колебаний.
15. Самая яркая планета — Венера. Она настолько ярка, что ее иногда можно различить даже днем.
18. Минералы, такие как глина, мел, камень и сланец, не блестят при трении, а также не плавятся в огне.

**б) Вынесение на первое место в предложении
предикативной части сказуемого**

1. Вокруг ядра и на значительном расстоянии от него движутся остальные электроны, необходимые для того, чтобы сделать атом нейтральным.
3. Со строительством плотины и силовой станции связаны другие важные мероприятия.
13. В группу соединений, которые будут рассмотрены, включены вещества, значительно различающиеся по своему строению и способу действия, однако обладающие одним общим свойством — способностью при точно определенных условиях образовывать нерастворимые металлоорганические соли.
16. В устье реки Невы, которая впадает в Финский залив, расположен Ленинград, построенный на более чем сотне островов дельты, соединенных 548 мостами.
17. С ростом населения связан постоянно увеличивающийся годовой расход электроэнергии на душу населения.
18. В конце грозового дождя много мелких капель воды находится в воздухе во взвешенном состоянии. От каждой капли отражаются лучи всех цветов спектра, каждый под различным углом.

в) в уступительных придаточных предложениях

1. Как бы это ни было трудно, автор решил дать свои собственные иллюстрации к этому тому.
4. Какой бы важной и ценной ни была физическая картина устойчивости, все же математическое определение дает более полезное и точное средство описания работы системы.
6. Какой бы полезной ни была руда, она не может быть выгодно использована, если ее нельзя будет получить в достаточном количестве и по цене, соизмеримой с ее полезностью.
8. Каким бы странным это ни казалось, теория чисел, будучи чистейшей математикой, может быть названа, с определенной точки зрения, эмпирической или даже экспериментальной наукой.
10. Каким бы невероятным это ни казалось, но тот факт, что жизнь появилась на нашей земле довольно скоро после образования земной коры, свидетельствует о том, что для случайного образования сложной органической молекулы потребовалось, вероятно, несколько сотен миллионов лет.

VIII. БЕССОЮЗНОЕ ПРИСОЕДИНЕНИЕ ПРИДАТОЧНЫХ ПРЕДЛОЖЕНИЙ

1. Вес одного атома почти полностью зависит от числа протонов и нейтронов, которые он содержит, так как электроны настолько легки, что они лишь незначительно увеличивают атомный вес.
2. Существует легко запоминающийся метод нахождения относительных направлений тока и магнитного поля, которое он создает.
3. Метод последовательных приближений Пикарда дал способ подхода к решению дифференциальных уравнений, совершенно отличный от всех тех, которыми ученые пользовались до этого при их решении.
13. Именно с помощью радио мы получаем большую часть информации, которую спутники собирают на границах космического пространства.
15. Если бы не было потери энергии в результате трения, то движение, раз уж оно началось, продолжалось бы бесконечно.

16. При вычислении момента инерции молекулы, обычно исходят из того, что каждый атом имеет соответствующее число нейтрализующих его электронов и что вся масса атома сосредоточена в одной точке.
17. Наиболее важное влияние, оказываемое Луной на Землю, наблюдается при образовании приливов.
21. Если бы не было земного притяжения, то спутники двигались бы в безвоздушном пространстве по прямой линии с постоянной скоростью. Именно земное притяжение заставляет их двигаться вокруг земли.
23. При изготовлении нецке (японской миниатюрной скульптуры) придается значение тому, какой эстетический эффект она может дать при ее практическом применении.
24. Когда Чехова попросили описать процесс его работы, он дал яркое, хотя и несколько не преувеличенное описание того, как обычно писались в то время «популярные пьесы».

IX. НЕПОЛНЫЕ ПРИДАТОЧНЫЕ ПРЕДЛОЖЕНИЯ

1. Окислы металлов, когда их находят в естественном состоянии, называют рудами.
2. Катализаторы наиболее активны, когда они находятся в растворе.
4. При обсуждении электропроводности интересно упомянуть об электронной структуре серебра и меди.
19. При любом данном давлении существует температура, при которой один вид топлива будет распадаться, если его выдерживать при данных условиях на протяжении достаточного периода времени, и в зависимости от состава данного топлива, это время может быть чрезвычайно коротким.
23. Важной особенностью, о которой следует помнить, размышляя о природе земного ядра, является то, что, хотя, возможно, оно состоит из вещества химически схожего с известным нам веществом, это вещество, если оно находится в твердом состоянии, возможно, существует в полиморфных формах, неизвестных нам.
24. Советская поэзия военного времени создала ряд произведений, которые в своей совокупности представляют собой нечто вроде панорамы того, что происходило в стране во время войны.

25. «Когда я пишу», говорит Чехов, «Я полагаюсь исключительно на то, что читатель добавит недостающие субъективные элементы повествования».
27. В современной музыке имеется целая система гармонии в том виде, в каком она была известна в начале 10-го столетия.

Х. НЕКОТОРЫЕ ДРУГИЕ ТРУДНОСТИ

Парные союзы the...the с прилагательным или наречием в сравнительной степени

1. Чем тяжелее плавающее тело, тем больше вес жидкости, которую оно будет вытеснять.
2. Чем сильнее заряжены тела, тем больше будет отталкивание или притяжение.
3. Чем выше чистота титана, тем легче его обработать, но тем меньше его прочность.
4. Обычно, чем меньше скорость кристаллизации, тем более совершенны получающиеся кристаллы.
5. Чем большей проводимостью обладает вещество, тем меньше его сопротивление.
14. Чем идеальнее условия, при которых выращивается кристалл, тем медленнее он приближается по своим качествам к правильной геометрической форме.
16. При прохождении тока через проводник, в результате сопротивления проводника выделяется тепло; чем больше сопротивление, тем больше выделяется тепла при прохождении данного тока.
20. Молекулы находятся в постоянном хаотическом движении. Мы называем его «тепловым движением», так как мы воспринимаем это движение в виде тепла: чем быстрее движение, тем горячее тело, причем повышение температуры выражается просто в увеличении кинетической энергии отдельных молекул.
22. Когда вы смотрите на предмет обоими глазами, вы автоматически фокусируете оба глаза на этом предмете. Чем ближе предмет, тем больше вам приходится приближать глаза друг к другу, а мускульное ощущение, возникающее от подобного движения (приспособления) даст вам достаточно хорошее представление о расстоянии.

That (of) и those (of)
как заместители существительного

3. Физика тел в состоянии покоя значительно проще, чем физика тел, находящихся в состоянии движения.
10. Единственная форма энергии, первая, которая стала известна человеку, была энергия его собственных мускулов.
11. Свойства естественных пород до некоторой степени сопоставимы со свойствами искусственных материалов.
12. В течение многих столетий материалами, которые первобытный человек использовал для строительства своих домов, были материалы, которые имелись под рукой, такие как камень, дерево и глина.
13. Наиболее удобной классификацией является классификация, приведенная в периодической системе Менделеева, в которой элементы расположены по периодам и группам.
15. Для того, чтобы увидеть молекулы в отдельности, мы обязательно должны использовать радиацию с длиной волны в тысячу раз короче, чем длина волны видимого света, или, другими словами, мы должны использовать радиацию, называемую рентгеновскими лучами.
18. Телевидение, передача видимых изображений из студии к приемному экрану, ставит такие проблемы, по сравнению с которыми проблемы радиовещания представляются очень простыми.
19. С помощью прибора, называемого спектро스코пом, астрономы и физики обнаружили, что элементы, из которых состоят солнце и звезды, являются почти точно такими же, как и элементы, из которых состоит земля.
20. Несмотря на огромную массу солнца по сравнению с массой луны, его влияние на приливы меньше, чем влияние луны. Это объясняется тем, что оно находится очень далеко от земли, почти в 400 раза дальше, чем луна.
21. Ломоносов задал себе весьма необычную для того времени задачу — задачу создания «математической химии».
22. Исследования с помощью телескопа обнаруживают существование, далеко в космическом пространстве,

большого количества гигантских групп звезд, очень похожих на группу звезд, к которой относится наше солнце.

Некоторые функции one

1. В этом сообщении следует придерживаться скорее логического, нежели исторического порядка, хотя и ссылаясь на исторические аспекты там, где они представляют интерес.
2. История радара — длинная, так как основной принцип был известен науке уже давно.
3. Как правило, жидкость, имеющая свободную поверхность, является такой жидкостью, на поверхности которой нет абсолютно никакого давления.
4. Следует использовать специальные приборы для измерения сопротивления в цепи.
8. Точное представление о состоянии системы в данный момент времени дает возможность определить ее точное поведение в будущем.
9. Вряд ли можно приступить к какому-либо исследованию без определенной цели и некоторого представления о том, что из этого может получиться.
10. Лавуазье был твердо убежден в том, что можно принять как нечто само собой разумеющееся, что в любой реакции имеется равное количество вещества до и после взаимодействия.
11. Как мы только что отметили, было время, когда предполагали, что тепло является своего рода веществом или жидкостью, которая течет от тела с высокой температурой к телу с более низкой температурой.
12. Если кто-либо попытается определить влияние ветров на температуру поверхности океана, ему придется исследовать состояние поверхностных слоев в различные времена года.
13. Сочетая данные о температуре солнечного ядра с известными фактами относительно скоростей реакций различных ядерных превращений, можно установить, какая именно реакция объясняет продуцирование солнечной энергии.
27. Следует знать, что электрический элемент — это прибор для превращения химической энергии в электрическую.

Некоторые функции глагола to do

1. После натирания многие вещества проявляют себя так же, как янтарь.
2. Радиоволны радара отражаются от самолета точно так же, как волны прожектора.
5. Имется некоторое доказательство того, что молекулы действительно существуют в растворе некоторых типичных солей при высокой концентрации ионов.
10. Мы знаем, что электрическая система автомобиля и самолета работает на постоянном токе, а также телеграф, телефон и поезд, не говоря уже о таких лабораториях, которым требуется постоянный ток для экспериментальной работы.
11. Теперь кажется несомненным, что определенный ион действительно обладает определенной подвижностью — (подвижностью), которая не изменяется со временем.
12. В квантовых вычислениях, в особенности для атомов и ядер, действительно имеет место чрезвычайно сложный анализ.
13. Чисто химические исследования вирусного материала действительно показали, что данный вирус можно рассматривать как вполне определенное химическое соединение.
15. В соответствии с законом сохранения энергии работа, затраченная зарядом, не теряется, а обязательно приводит к возникновению эквивалентной величины энергии того или иного рода.

Некоторые функции глагола to be

1. Главная задача геолога заключается в том, чтобы обнаружить геологические условия, свидетельствующие о наличии нефти.
3. Подтверждение открытия Джоуля можно найти в повседневной жизни.
5. Ученый должен обладать способностью заглядывать в будущее, если он намерен правильно спланировать свою работу.
18. Несколько очень древних зданий можно все еще видеть в Анурадхапуре в состоянии достаточно хорошей сохранности, несмотря на то, что со времени их построения прошло более 2 тыс. лет.

19. С точки зрения Маларме стих следует рассматривать как музыкальную фразу, как небольшой оркестр, как своего рода камерную музыку.
20. В 17-летнем возрасте, если судить по нарисованному им пейзажу, Леонардо был удивительно зрелым художником, обладавшим собственным стилем.

Некоторые функции глагола **to have**

To have + Infinitive

в составном глагольном сказуемом

1. Радиочастоту необходимо выбирать таким образом, чтобы ее период равнялся тому времени, которое требуется ионам на то, чтобы совершить один оборот.
9. Во время любого анализа приходится учитывать материалы, из которых изготовлен данный прибор; вызывает сомнение, всегда ли уделяется достаточное внимание этому аспекту основного метода.

Оборот «**to have + существительное + Infinitive**»

2. При данных условиях очень удобно, чтобы пластинка находилась на горизонтальной плите.
3. Точность системы — это ее способность к тому, чтобы регулируемая переменная сохраняла желаемую величину с минимальной ошибкой.
5. В случае конструкции, приведенной на рис. 16, можно использовать переменный ток в самой нити накала и вместе с тем не допустить, чтобы падение потенциала переменного тока в нити накала не влияло на поток электронов, исходящий от катода.
13. Когда Менделеев создавал свою таблицу, было очевидно, что необходимо оставить несколько свободных мест с тем, чтобы элементы, которые будут открыты в дальнейшем, попали в соответствующие группы.

Оборот **to have + существительное + Past participle**

4. Когда трава достаточно высока, ее косят и сушат, превращая в сено.
14. Единственный способ, с помощью которого могут быть изменены свойства промышленно чистого металла — это холодная деформация и регулирование процесса отжига, который может последовать за холодной обработкой.

Черная А. И.

КРАТКИЙ ГРАММАТИЧЕСКИЙ
СПРАВОЧНИК

I. СВОДНАЯ ТАБЛИЦА ВРЕМЕН

	Active			
	Indefinite	Continuous	Perfect	Perfect Continuous
Present	I write	I am writing	I have written	I have been writing
Past	I wrote	I was writing	I had written	I had been writing
Future	I shall write	I shall be writing	I shall have written	I shall have been writing
	Passive			
Present	I am asked	I am being asked	I have been asked	
Past	I was asked	I was being asked	I had been asked	
Future	I shall be asked		I shall have been asked	

П р и м е ч а н и е. Времена Future Perfect, Past Perfect Continuous и Future Perfect Continuous active, а также Future Perfect Passive в научной литературе употребляются редко.

II. СТРАДАТЕЛЬНЫЙ ЗАЛОГ

Глагол в страдательном залоге можно переводить на русский язык тремя способами:

1. При помощи глагола «быть» и краткой формы причастия страдательного залога.

2. Глаголом несовершенного вида с окончанием на -ся и -сь.

3. Неопределенно-личным оборотом с глаголом в действительном залоге в третьем лице множественного числа.

In the middle of the XIXth century about sixty different elements were discovered.

В середине XIX века было открыто около шестидесяти различных элементов.

The reaction is effected under very high pressure.

Эта реакция осуществляется при очень высоком давлении.

This metal is heated and then cooled in the air.

Этот металл нагревают, а затем охлаждают на воздухе.

Особенности перевода некоторых типов глаголов в страдательном залоге

§ 1. Глаголы типа: to allow, to permit, to give, to offer, to promise, to show, to tell, to teach и др. с примыкающим к ним прямым дополнением, употребляющиеся в страдательном залоге.

Предложения с глаголом-сказуемым данного типа переводятся на русский язык:

а) Неопределенно-личным предложением, если дополнение с предлогом by отсутствует; в этом случае подлежащее английского предложения становится в русском предложении косвенным дополнением в дательном падеже.

She was shown a new device.

Ей показали новое устройство.

This phenomenon may be given a very simple physical interpretation.

Этому явлению можно дать очень простое физическое толкование.

б) Предложением с глаголом-сказуемым в действительном залоге, при наличии в английском предложении дополнения с предлогом by; дополнение с предлогом by становится подлежащим русского предложения, а подлежащее английского предложения становится косвенным дополнением в дательном падеже.

He was shown a new device by Mr. Brown.

Мистер Браун показал ему новое устройство.

§ 2. Непереходные глаголы с предлогами типа: *to act on (upon), to look at (upon), to refer to, to substitute for, to send for* и т. д. и глагольные фразеологические сочетания: *to do away with, to make use of, to pay attention to* и др.

Предложения с глаголом-сказуемым этого типа переводятся на русский язык:

а) неопределенно-личным предложением (если дополнение с предлогом *by* отсутствует).

<i>This article is often referred to.</i>	На эту статью часто ссылаются.
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б) предложением с глаголом-сказуемым в действительном залоге (при наличии в английском предложении дополнения с предлогом *by*). Предлог, стоящий после глагола в страдательном залоге, ставится перед тем словом, которое в английском предложении является подлежащим.

<i>A charged particle is acted on by forces.</i>	На заряженную частицу действуют силы.
<i>This method will be soon done away with.</i>	От этого метода скоро откажутся.
<i>Selenium is made use of in photo-cells.</i>	Селен используется в фото-элементах.

§ 3. Переходные глаголы, которые соответствуют русским переходным глаголам, употребляющимся с предлогом типа, *to affect, to answer, to approach, to attend, to follow, to influence, to watch* и др.

Предложения с глаголом-сказуемым такого типа переводятся так же, как указано в параграфе 2, с той разницей, что перед словом, являющимся в английском предложении подлежащим, ставится предлог русского глагола.

<i>The letter was answered immediately.</i>	На письмо ответили немедленно.
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<i>The ignition was followed by combustion.</i>	За воспламенением последовало горение.
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<i>The behaviour of metals is greatly affected by the changes in temperature.</i>	На поведение металлов большее влияние оказывают изменения температуры.
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III. СОГЛАСОВАНИЕ ВРЕМЕН¹

Если сказуемое главного предложения выражено глаголом в одной из форм прошедшего времени, то и сказуемое придаточного дополнительного предложения должно стоять в одном из прошедших времен. В таких случаях Past Indefinite или Past Continuous в придаточном предложении переводится на русский язык настоящим временем; Future in the Past переводится будущим временем, а Past Perfect — прошедшим временем.

He knew that the results *were correct*.

Он знал, что результаты *правильны*.

He considered that this problem *would be solved* in the nearest future.

Он считал, что эта проблема *будет разрешена* в ближайшем будущем.

He was able to prove that he *had worked out* this problem as early as 1960.

Он смог доказать, что *разработал* эту проблему еще в 1960 году.

П р и м е ч а н и е. При переводе на русский язык косвенного вопроса следует соблюдать правило согласования времен. Союзы *whether* или *if* переводятся частицей «ли», которая ставится после глагола-сказуемого.

It was necessary to determine *whether (if)* the particle moved upward or downward.

Необходимо было определить перемещается *ли* частица вверх или вниз.

I was not sure *whether (if)* this theory would account for these phenomena.

Я не был уверен, даст *ли* эта теория объяснение данным явлениям.

IV. СОСЛАГАТЕЛЬНОЕ НАКЛОНЕНИЕ

Сослагательное наклонение выражает предполагаемое, условное или желаемое действие. Форма сослагательного наклонения в русском языке передается глаголом в прошедшем времени с частицей «бы».

В английском языке сослагательное наклонение может выражаться как простыми, так и сложными формами. Все глаголы имеют две простые формы (одинаковые для всех лиц единственного и множественного числа). Одна форма внешне совпадает с инфинитивом без частицы *to*. Вторая форма совпадает с формой прошедшего времени изъявительного наклонения (но глагол *to be* имеет во всех лицах форму *were*). Все глаголы образуют сложные формы с помо-

¹ В современном английском языке правило согласования времен часто не соблюдается.

щью вспомогательных глаголов *should* или *would* и инфинитива без частицы *to* или *should (shall)* во всех лицах и инфинитива без частицы *to*. Формы сослагательного наклонения (простые и сложные) могут также иметь перфектную форму. Для выражения сослагательного наклонения также могут использоваться модальные глаголы *may*, *might* и *could* причем *could*-всегда сохраняет свое модальное значение, а *may* и *might* не всегда.

В современном английском языке сослагательное наклонение в основном встречается:

1. В простых предложениях со значением предположения, возможности.

Without the radio we *should have* very great difficulties in observing man-made satellites.

Без радио мы *столкнулись бы* с очень большими трудностями при наблюдении за искусственными спутниками.

Refractory metal processing *would generally be* impossible without vacuum technique.

Обработка тугоплавких металлов *была бы*, вообще говоря, невозможной без применения вакуумной техники.

2. В придаточных предложениях после безличных оборотов типа *it is essential*, *it is important*, *it is desirable* и т. д.

It is essential that the substance *be* chemically pure.

Важно, *чтобы* это вещество было химически чистым.

It is desirable that this method *should be tested* in practice.

Желательно, *чтобы* этот метод *был проверен* на практике.

3. В дополнительных придаточных предложениях, после глаголов, выражающих приказание, предложение, желание.

Orbiting space stations will demand that man *climb* about «in the open» to make repairs, take photos and monitor instruments.

Применение орбитальных космических станций потребует, *чтобы* человек *перемещался* вне станции для осуществления ремонтных работ, фотографирования и контроля за работой приборов.

He suggested that these parts *should be tested* under very severe conditions.

Fortunately for the applied mathematicians, measurements made by the engineer and scientist in general are not exact and do not require that numerical calculations *shall be exact* either.

A comparison of the electrical properties of different metal samples demands that the samples *shall be* of the same dimensions.

4. В п р и д а т о ч н ы х п р е д л о ж е н и я х, в в о д и м ы х с о ю з а м и *that* (чтобы), *so that* (с тем, чтобы), *in order that* (для того, чтобы), *lest* (чтобы не), *but for* (если бы не).

The primary condition *that* the system *be stable* is already satisfied.

As we move, we do so by issuing commands to the muscles, so that they *shall contract* to an extent that has been determined by some previous estimate of the distance to be travelled and the force to be used.

We should be on our guard, lest we *should be* wholly captivated by the marvels of modern electronics.

Он предложил, чтобы эти детали были испытаны в очень тяжелых условиях.

К счастью для специалистов в области прикладной математики, измерения, проводимые инженером и научным работником, обычно являются неточными, и поэтому не требуется, чтобы численные расчеты также были точными.

Для сравнения электрических свойств различных металлических образцов требуется, чтобы они были одинаковых размеров.

Основное условие, чтобы система была стабильна, уже выполнено.

Когда мы передвигаемся, то мы осуществляем это, отдавая приказание мускулам, чтобы они сокращались в той мере, как это было определено некоторым предварительным расчетом расстояния, которое необходимо преодолеть, и силы, которую необходимо затратить.

Мы должны быть настороже, чтобы не подпасть полностью под влияние чудес, которые сулит современная электроника.

Numerical analysis is the branch of mathematics that provides methods for the transformation of problems so that they *may be attacked* in purely arithmetic way.

In order that such a transformation may be possible, steel must be heated to a very high temperature.

Численный анализ является областью математики, которая дает методы приведения задач к такой форме, чтобы их можно было решить чисто арифметическим путем.

Для того, чтобы такое преобразование было возможно, сталь следует нагреть до очень высокой температуры.

5. В придаточных предложениях, вводимых союзами *as if, as though* (как если бы).

Applied mathematics deals with physical quantities as if (though) they *were* mathematical concepts.

Прикладная математика оперирует с физическими величинами, как если бы они были математическими понятиями.

6. В условных предложениях II и III типа

V. УСЛОВНЫЕ ПРЕДЛОЖЕНИЯ

Придаточные условные предложения вводятся союзами *if, unless, provided, in case* и др.

Тип условного предложения	Время сказуемого в придаточном предложении	Время сказуемого в главном предложении
I. Реальное	Present Indefinite ¹	Future Indefinite
II. Маловероятное (для будущего) и нереальное (для настоящего времени)	Форма, омонимичная Past Indefinite (для <i>to be — were</i>)	Should, would, might; could + Indefinite Infinitive
III. Нереальное (для прошедшего времени)	Форма, омонимичная Past Perfect	Should (would), might; could + Perfect Infinitive

¹ В условных предложениях I типа сказуемое в главном и придаточном предложениях может стоять в любом времени изъявительного наклонения. Приведенные в таблице формы встречаются наиболее часто.

Условные предложения I типа переводятся на русский язык изъявительным наклонением.

If conditions *are* favourable we shall apply this method in practice.

Если условия *будут* благоприятными, то мы применим этот метод на практике.

He will calculate the area of this body, provided he *knows* its dimensions.

Он определит площадь этого тела при условии, что ему *будут известны* его размеры.

Примечание 1. В придаточной части условных предложений I типа иногда употребляются сложные формы сослагательного наклонения (*should* во всех лицах + инфинитив без *to*), что указывает на меньшую вероятность осуществления действия по сравнению с обычными условными предложениями I типа. Переводить такие условные предложения следует изъявительным наклонением

If the lubricant supply *should stop* (should the lubricant supply stop) even momentarily, serious damage may result.

Если подача смазки *прекратится* даже на одно мгновение, то может произойти серьезное повреждение.

Примечание 2. В придаточной части условных предложений I типа иногда употребляется простая форма сослагательного наклонения *be*. В главной части сказуемое выражено изъявительным наклонением. Переводить такие условные предложения следует изъявительным наклонением.

If any material *be placed* in a magnetic field, the effect of the field is to set up magnetic poles at opposite ends of the specimen.

Если любой материал *поставить* в магнитное поле, то эффект поля выразится в создании магнитных полюсов на противоположных концах образца.

Условные предложения II и III типа переводятся на русский язык сослагательным наклонением, т. е. глаголом в прошедшем времени с частицей «бы»

If a satellite *moved* in different orbits, each within a thousand kilometers from the earth's surface, the variations in speed *would be* relatively small.

Если бы спутник *двигался* по различным орбитам, расположенным в пределах тысячи километров от поверхности Земли, то разница в скорости движения *была бы* сравнительно небольшой.

If these instructions *were violated* (were these instructions violated), we *could not get* the right answer.

If he *had taken* into account (had he taken into account) the properties of this metal he *would have got* better results.

Примечание 1. В придаточной части условных предложений II типа иногда употребляется сложная форма сослагательного наклонения (*should* во всех лицах + инфинитив без *to* или *were* + Infinitive с частицей *to*), что указывает на меньшую вероятность осуществления действия по сравнению с обычными условными предложениями II типа.

If the lubricant supply *should stop* (should the lubricant supply stop) even momentarily, serious damage *might result*.

If we *were to make* (were we to make) a close study of this metal, we *should find* that it does not oxidize.

The man-made satellites are in a sense creatures of the radio age. One *might say* that were it not for the radio, there *would be* little point in sending them up.

If the satellite's speed *were less* than the necessary one, the satellite *might drop* and *enter* the denser layers of the atmosphere.

Если бы эти инструкции были нарушены, то мы не смогли бы получить правильного ответа.

Если бы он принял во внимание свойства этого металла, то он получил бы лучшие результаты.

Если бы подача смазки прекратилась даже на одно мгновение, то могло бы произойти серьезное повреждение.

Если бы мы тщательно исследовали этот металл, то мы бы установили, что он не окисляется.

Искусственные спутники являются в некотором смысле созданиями века радио. *Можно было бы утверждать*, что если бы не радио, то почти не имело бы смысла их запустить.

Если бы скорость полета спутника была меньше необходимой, то спутник мог бы упасть и войти в более плотные слои атмосферы.

Faraday could not have calculated the results of his experiments with the best modern high-speed digital calculator had it been miraculously put at his disposal, because he would not have known what formulas to give the machine.

Если бы каким-нибудь чудом в распоряжение Фарадея была предоставлена самая совершенная современная быстроедействующая вычислительная машина, он все же не смог бы с ее помощью рассчитать результаты своих экспериментов, так как он не знал бы, как запрограммировать эту машину.

VI. УПОТРЕБЛЕНИЕ SHOULD

Should употребляется:

1. В качестве вспомогательного глагола.

а) В первом лице единственного и множественного числа — для образования Future in the Past.

We knew that we should be able to account for this phenomenon.

Мы знали, что мы сможем объяснить это явление.

б) В первом лице единственного и множественного числа — для образования сложных форм сослагательного наклонения, употребляющихся в главной части условных предложений II и III типа.

If there were no oxygen in the air, we should be unable to live.

Если бы в воздухе не было кислорода, то мы не могли бы жить.

We should have investigated this phenomenon if we had had time.

Мы исследовали бы это явление, если бы у нас было время.

в) Во всех лицах единственного и множественного числа — для образования сложных форм сослагательного наклонения, употребляющихся в придаточной части условных предложений I (для указания на меньшую вероятность осуществления) и II типа.

Should the water pressure in a turbine fall below the evaporation pressure, vapour will be formed.

Если давление воды в турбине упадет ниже давления испарения, то образуется пар.

Should the water pressure in a turbine *fall* below the evaporation pressure, vapour would be formed.

Если бы давление воды в турбине *упало* ниже давления испарения, то образовался бы пар.

г) Во всех лицах единственного и множественного числа — для образования сложных форм сослагательного наклонения, употребляющихся в придаточных предложениях: подлежащих, дополнительных и обстоятельства цели.

It is essential that we *should know* what structural changes result from heating hardened steel to critical temperature.

Важно, *чтобы* мы *знали*, какие структурные изменения происходят в результате нагрева закаленной стали до критической температуры.

They proposed that this metal *should be heated* up to 500° C.

Они предложили, *чтобы* этот металл *был нагрет* до 500° C.

Put down these data lest you *should forget* them.

Запишите эти данные, *чтобы* не забыть их.

2. В качестве модального глагола со значением «следует», «надлежит» — во всех лицах единственного и множественного числа.

It *should* be noted from the outset that this technique fails to give satisfactory results.

Следует отметить с самого начала, что этот метод не дает удовлетворительных результатов.

VII. УПОТРЕБЛЕНИЕ WOULD

Would употребляется:

1. В качестве вспомогательного глагола.

а) Во втором и третьем лице — для образования Future in the Past.

We were not sure whether this new metal *would meet* the requirements of our industry.

Мы не были уверены, *будет* ли этот новый металл *отвечать* всем требованиям нашей промышленности.

б) Во втором и третьем лице — для образования сложных форм сослагательного наклонения, употребляющихся в простых предложениях со значением предположения, возможности.

It would be impossible to meet all the difficulties without this new method.

Было бы невозможно преодолеть все трудности без применения этого нового метода.

в) Во втором и третьем лице — для образования сложных форм сослагательного наклонения, употребляющихся в главной части условных предложений II и III типа.

If there were no friction many motions would be impossible.

Если бы не было трения, то многие виды движения были бы невозможны.

Galileo's discovery of the law of the pendulum would have been of little interest had it been valid only for that pendulum on that afternoon.

Открытие Галилеем закона маятника не имело бы большого значения, если бы он был применим только для данного маятника в тот день.

2. В качестве модального глагола.

Во всех лицах единственного и множественного числа — для выражения нежелания совершить действие в прошлом (в отрицательном предложении).

We tried to persuade him but he would not do this work.

Мы старались убедить его, но он не хотел выполнить эту работу.

3. Для обозначения обычного повторного действия в настоящем, прошедшем и будущем — во всех лицах единственного и множественного числа.

The instrument connected to terminal A would give readings every ten minutes.

Прибор, присоединенный к отводу А, дает показания каждые десять минут.

Formerly these designs would base entirely on cut and try methods.

Раньше эти расчеты полностью основывались на эмпирических методах.

We finally mention plans for the use of computers in traffic control, primarily airplane traffic over airports and possibly automobile traffic on city streets. In the former case the computer *would keep* a record of flights destined for an airport and *would give* orders for incoming planes to land or to wait, or if necessary to proceed to alternate airports. In the latter case the computer *would receive* current traffic information from electric eyes and *would control* the setting of traffic lights accordingly.

Наконец, мы упомянем о планах использования вычислительных машин для регулирования движения, в первую очередь движения самолетов, в зоне аэропортов, а также, возможно, регулирование автомобильного движения на городских улицах. В первом случае вычислительная машина *будет регистрировать* полеты самолетов к данному аэропорту и *будет давать* команды прибывающим самолетам совершить посадку или не садиться, или, если это необходимо, продолжать полет к другим аэропортам. Во втором случае вычислительная машина *будет получать* текущую информацию от «электрических глаз» и *будет регулировать*, соответственно, включение световой сигнализации.

VIII. НЕЛИЧНЫЕ ФОРМЫ ГЛАГОЛА

1. Инфинитив и инфинитивные обороты

Формы инфинитива

	Active	Passive
Indefinite	to write	to be written
Continuous	to be writing	—
Perfect	to have written	to have been written
Perfect Continuous	to have been writing	

Функции инфинитива в предложении

В предложении инфинитив может выполнять следующие функции:

а) Подлежащего:

To master this speciality is very important.

Овладеть (овладение) этой специальностью очень важно.

б) Именной части составного сказуемого:

The aim of our research work is to find the necessary data.

Цель нашей исследовательской работы (заключается в том, чтобы) определить все необходимые данные.

в) Части составного глагольного сказуемого с модальным оттенком:

Many other processes have to be taken into account for a complete explanation of the phenomena.

Для полного объяснения этих явлений следует принять во внимание многие другие процессы.

г) Дополнения:

He likes to speak with us on this subject.

Ему нравится говорить с нами на эту тему.

д) Обстоятельства цели (может стоять в начале или в конце предложения):

Late in the 19th century metallurgists began to use the microscope to examine metals.

В конце XIX века металлурги начали использовать микроскоп для изучения металлов.

To examine metals, metallurgists began...

Для изучения металлов металлурги начали...

е) Обстоятельства следствия (стоит после наречий *too, sufficiently, enough*). Переводится неопределенной формой глагола с союзом «(для того) чтобы» и часто имеет модальный оттенок.

The investigation of phase changes in metals and alloys by means of cooling curves is

Исследование фазовых изменений металлов и сплавов при помощи кривых охлаждения

too well known to require discussion here.

Достаточно хорошо известно, (для того) чтобы требовать рассмотрения здесь.

ж) **О п р е д е л е н и я** (стоит после определяемого существительного). Обычно переводится на русский язык определительным придаточным предложением со значением должествования, возможности или будущего времени:

The first point to notice is that this reaction proceeds at very high temperatures.

Первый момент, на который следует обратить внимание, это то, что данная реакция протекает при очень высоких температурах.

A plant to produce X-ray apparatus is under construction in the Estonian town of Tartu.

В настоящее время в эстонском городе Тарту строится завод, который будет выпускать рентгеновскую аппаратуру.

It is necessary to know the temperatures to be expected under different conditions.

Необходимо знать температуры, которые можно ожидать при различных условиях.

Иногда инфинитив в функции определения переводится прилагательным.

In the years to come the metal will be widely used in industry.

В ближайшие годы этот металл найдет широкое применение в промышленности.

Инфинитив в функции определения после слов the first, the second и т. д., the last, the only и др. переводится глаголом в личной форме, в том времени, в котором стоит сказуемое главного предложения.

Turbine was the first to be invented and the last to be perfected.

Турбина была первой изобретена и последней усовершенствована.

П р и м е ч а н и е. Инфинитив в функции определения к подлежащему с предшествующими there is и there are обычно переводится начиная со слов «следует», «может быть»; инфинитив английского предложения переводится инфинитивом в действительном залоге, а подлежащее английского предложения — дополнением.

Certainly there are many problems to be solved.

There is no benefit to be obtained by using this method.

Конечно, *следует решить* много проблем.

Применение этого метода *не может дать* существенных преимуществ.

3. Вводного члена предложения (выражает высказывание автора и всегда выделяется запятой). Чаще всего переводится на русский язык деепричастным оборотом, или неопределенной формой глагола с союзом «если».

To draw upon the terminology of another profession, one may say that we have graduated from the anatomy of components to the physiology of an organic whole.

Используя (если использовать) терминологию другой области, то можно сказать, что мы перешли от анатомии отдельных деталей к физиологии органического целого.

Оборот «Именительный падеж с инфинитивом»

Это — сложное подлежащее, состоящее из существительного в общем падеже или из личного местоимения в именительном падеже с инфинитивом.

Употребляется с глаголами to seem, to appear, to prove, to happen, to turn out (в активном залоге) и to say, to know, to think, to see, to find, to believe, to suppose, to assume, to claim и др. (в страдательном залоге) и с сочетаниями слов to be likely, to be unlikely, to be certain, to be sure.

Переводится сложноподчиненным предложением; сказуемое английского предложения становится сказуемым главного предложения в неопределенно-личной форме, подлежащее — подлежащим придаточного предложения, а инфинитив — сказуемым. Можно также переводить простым предложением, в котором неопределенно-личный оборот употребляется как вводное предложение.

Magnetism is believed to be set up by the motion of electrons.

Предполагается, что магнетизм возникает в результате движения электронов.

Магнетизм, как предполагают, возникает в результате движения электронов.

In recent years *the determination* of time by direct observations of the earth's rotation *has been found to be inadequate* because of small but perceptible change in its rotational speed.

A recent *determination* of the orbits of the five outer planets *is reported to have involved* over twelve million arithmetic operations.

India appears to have been acquainted with iron and steel from an early age.

This temperature is likely to be the same.

This is unlikely to be achieved.

Примечание I. Именительный падеж с инфинитивом, с глаголами в отрицательной форме.

При сказуемом, выраженном глаголом в действительном залоге, отрицание обычно относится к инфинитиву.

This phenomenon does not appear to have been studied.

There is much work which can be put into mathematical form although at first sight *it may not appear to have anything to do with arithmetic.*

При сказуемом, выраженном глаголом в страдательном залоге, отрицание обычно относится к сказуемому.

This reaction, however, is not expected to continue indefinitely.

За последние годы было найдено, что измерение времени путем непосредственного наблюдения вращения земли является неприемлемым вследствие небольшого, но ощутимого изменения скорости вращения.

Сообщается, что произведенное недавно определение орбит пяти внешних планет *потребовали* свыше двенадцати миллионов арифметических операций.

Индия, по-видимому, знала о железе и стали еще с давних времен.

Возможно, что эта температура будет такая же.

Маловероятно, что это будет достигнуто.

По-видимому, это явление не было изучено.

Есть много процессов, которые можно выразить математическими формулами, хотя на первый взгляд может показаться, что они не имеют ничего общего с арифметикой.

Однако не предполагается, что эта реакция будет продолжаться бесконечно долго.

П р и м е ч а н и е 2. Оборот «Именительный падеж с инфинитивом» в определительном придаточном предложении, или причастном обороте, а также после Participle I от глагола *appear* или после слов *likely, certain*. Во всех случаях обороты переводятся определительным придаточным предложением.

In this chapter we present a small selection of problems *which are believed to constitute* a representative sample.

In addition to the trace of water the only constituent *known to be present* on Mars is carbon dioxide (about 5 percent).

The experiment *believed to have proved* successful, will be discussed at the conference.

The findings, *appearing to belong* to the same period are of considerable interest.

The apparatus *likely to give* the results required is being repaired.

В этой главе мы даем небольшое количество задач, *которые, как мы полагаем, являются* характерным примером.

Помимо следов воды, единственная составляющая, *которая, как известно, присутствует* на Марсе, это двуокись углерода (~5%).

Опыт, *который, как полагают, оказался* успешным, будет обсужден на конференции.

Результаты, *которые, по-видимому, относятся* к тому же периоду времени, представляют значительный интерес.

Прибор, *который, вероятно, даст* требуемые результаты, в настоящее время находится в ремонте.

Оборот «Объектный падеж с инфинитивом»

Это — сложное дополнение, представляющее сочетание существительного в общем падеже или личного местоимения¹ в объектном падеже с инфинитивом. Употребляется после глаголов *to think, to know, to believe, to consider, to assume, to expect, to suppose, to cause, to allow, to permit, to feel, to see, to notice, to observe, to want* и др.

Переводится дополнительным придаточным предложением, начинающимся с союзов «что» или «чтобы», причем существительное (или местоимение) становится подле-

жащим придаточного предложения, а инфинитив — сказуемым.

On close examination of a piece of granite we *find it to be composed* of several kinds of minerals.

We *want this meter to be tested* under very severe conditions.

При тщательном исследовании куска гранита мы *обнаруживаем, что он состоит* из нескольких видов минералов.

Мы *хотим, чтобы этот измерительный прибор был испытан* в очень тяжелых условиях.

Примечание 1. После глаголов-сказуемых, выражающих чувства и восприятие, последующий инфинитив употребляется без частицы *to*.

Passengers watching the heavens from a westbound rocket will observe the sun *halt* and then *start* to move at great speed from west to east.

Пассажиры, наблюдающие небо с ракеты, движущейся на запад, заметят, что солнце *остановится*, а затем *начнет двигаться* с большой скоростью с запада на восток.

The turn of the century saw the era of coal and iron *give way* to one based on steel, light alloys and electricity.

Конец нашего века явился свидетелем того, как эра угля и железа *уступает* место эре стали, легких сплавов и электричества.

Примечание 2. Когда сказуемое выражено глаголами *to make, to get, to cause* (в значении «заставлять»), *to allow, to permit, to enable*, и если при этом инфинитив стоит в активном залоге, то при переводе следует сохранять порядок слов английского предложения:

This *causes* the current *to flow* in the circuit.

Это *заставляет* ток *протекать* по цепи.

Radio astronomy *enables* us *to observe* the state of the universe at distances very much greater than optical astronomy can reach.

Радиоастрономия *позволяет* нам *изучать* условия во вселенной на расстояниях, значительно больших, чем это достижимо для оптической астрономии.

Если инфинитив стоит в страдательном залоге, его следует переводить сразу после глагола, причем инфинитив в страдательном залоге переводится инфинитивом в действительном залоге, и, следовательно, стоящее перед ним существительное становится дополнением к инфинитиву.

The use of this technique *permits* more accurate calculations *to be performed*.

Использование этого метода *дает возможность выполнить* более точные расчеты.

Примечание 3. Объектный падеж с инфинитивом употребляется не только после глаголов в личной форме, но и после неличных форм глагола.

We expect *to see* the pure mathematicians become interested in new logical problems that computers have made urgent.

Мы ожидаем, что специалисты в области чистой математики начнут интересоваться новыми логическими проблемами, решение которых стало настоятельно необходимым в результате появления вычислительных машин.

Примечание 4. Объектный падеж с Participle I употребляется после глаголов *to see, to feel, to hear, to watch* и др. и указывает на совпадение выраженного причастием действия с действием, выраженным личной формой глагола.

Automation enthusiasts *see* completely automatic factories *turning out* products of different kind.

Энтузиасты автоматизации уже *видят* в своем воображении, как полностью автоматизированные заводы *выпускают* различную продукцию.

Предложный оборот «for + существительное (или местоимение) + инфинитив

Может входить в состав любого члена предложения. (В научной литературе чаще всего применяется в функции обстоятельства цели или следствия.)

Переводится либо инфинитивом, либо придаточным предложением, вводимым союзами «что» или «чтобы», причем существительное (или местоимение) этого оборота становится подлежащим придаточного предложения, а инфинитив — сказуемым.

It is impossible for this steel to be tested under these severe conditions.

Эту сталь нельзя испытывать при таких тяжелых условиях.

It may be pointed out that it is not always necessary for the thermocouple to be in contact with the object of which it is required to know the temperature.

Можно отметить, что не всегда необходимо, чтобы термопара контактировала с объектом, температуру которого требуется определить.

For many years, the unit of time, the second, was defined as a certain fraction (1/86,400) of average time required for the earth to rotate on its axis with respect to the sun.

В течение многих лет единица времени — секунда — определялась как определенная часть (1/86.400) среднего времени, необходимого для того, чтобы Земля обернулась вокруг своей оси по отношению к Солнцу.

Употребление некоторых модальных глаголов с перфектным инфинитивом

Must и *may* выражают предположение. *Must* перед Perfect Infinitive переводится словами «должно быть»; *may* перед Perfect Infinitive — словами «возможно», «по-видимому».

Some mistakes must have been made in assembling the parts of the machine.

Должно быть, при сборке этой машины были допущены некоторые ошибки.

These poles may have existed in the original magnet.

Эти полюсы, по-видимому, существовали в естественном магните.

2. Герундий и герундиальные обороты **Формы герундия**

	Active	Passive
Indefinite	writing	being written
Perfect	having written	having been written

Функции герундия в предложении

Герундий переводится на русский язык существительным, деепричастием, инфинитивом, придаточным предложением.

В предложении герундий может выполнять следующие функции:

а) Подлежащего:

Making these calculations may be a very difficult and timeconsuming procedure.

Выполнение этих расчетов может оказаться очень трудной и длительной процедурой.

б) Именной части составного сказуемого:

My favourite occupation is reading.

Мое любимое занятие — чтение.

в) Дополнения (прямого и предложного):

They started correlating the properties of these two metals.

Они начали сравнивать свойства этих двух металлов.

They spoke of building a new heat-treating furnace.

Они говорили о постройке новой термической печи (о том, чтобы построить новую термическую печь).

г) О б с т о я т е л ь с т в а (чаще всего времени, причины и образа действия). Перед герундием в этой функции всегда стоит один из следующих предлогов: *after*, *before*, *in*, *on*, *upon*, *without*, *for*, *by* и др.

After providing the factories with machinery, we began to produce large quantities of consumer goods.

Снабдив (после того как мы снабдили) заводы необходимым оборудованием, мы начали выпускать предметы широкого потребления в больших количествах.

Before heating these parts you should carefully clean them.

Прежде чем нагревать эти детали, вы должны тщательно прочистить их.

д) О п р е д е л е н и я. Обычно употребляется с предлогами *of* или *for*.

The new method of treating steel was approved.

Новый метод обработки стали был одобрен.

Герундиальный оборот

Герундиальный оборот переводится на русский язык дополнительным придаточным предложением, причем существительное (или притяжательное местоимение) становится подлежащим придаточного предложения, а герундий — сказуемым.

Mere mechanization is muscular action, that is to say, our limbs can move *without our having to use our brains*.

Простая механизация является действием мускулов, т. е. наши конечности могут выполнять движения *без необходимости участия нашего мозга*.

3. Причастие и причастные обороты

Формы причастия

	Active	Passive
Participle I Ind.	sending	being sent
Participle I Perfect	having sent	having been sent
Participle II		sent

Функции причастия в предложении

В предложении причастие может выполнять следующие функции:

а) **О п р е д е л е н и я** (Participle I Active и Passive и Participle II):

Insulating materials are used for covering electric wires.

Изолирующие материалы используются для покрытия электропроводов.

The properties of the metal being mined are unknown.

Свойства добываемого металла неизвестны.

Inorganic polymers currently being investigated at this plant are difficult to prepare by present techniques.

Неорганические полимеры, которые изучаются в настоящее время на этом заводе, трудно получить при помощи современных методов.

The method of analysis used is the same as that employed in previous section; for this reason the examples chosen will not be analysed in detail, but the results obtained will be discussed briefly.

Применяемый метод анализа является тем же методом, который использовался в предыдущей главе; поэтому не будут подробно проанализированы все *выбранные* примеры, а лишь кратко рассмотрены полученные результаты.

6) О б с т о я т е л ь с т в а (Participle I Indefinito Active и Passive, Participle I Perfect и Participle II):

Working in northern Italy and France, Leonardo da Vinci (1452—1519) drew many remarkable scetches of aeronautical devices and also made an extensive study of flight of birds.

Работая в северной части Италии и во Франции, Леонардо да Винчи (1452—1519) выполнил много замечательных эскизов авиационных устройств, а также провел тщательные исследования полета птиц.

(While) *considering* the matter he encountered many difficulties.

Рассматривая этот вопрос, он столкнулся со многими трудностями.

Electron microscope is by no means a recent invention, *having originated* about 1931.

Электронный микроскоп ни в коем случае нельзя считать новым изобретением, так как он *был разработан* около 1931 г.

Having considered the matter, we arrived at a definite decision.

Рассмотрев (после того как мы рассмотрели) этот вопрос, мы пришли к определенному решению.

Having been read by the scientist, the magazines were returned to the library.

После того как журналы *были прочитаны* учеными, их вернули в библиотеку.

Независимый причастный оборот

Независимый причастный оборот представляет собой сочетание существительного или местоимения в функции подлежащего с причастием, выполняющим предикативную функцию.

Независимый причастный оборот всегда отделяется от главной части предложения запятой. Независимый причастный оборот переводится обстоятельством при-

точным предложением с союзами «после того как», «когда», «так как», «поскольку», «если» и др. или же самостоятельным предложением с союзами «причем», «а», «и».

1. Независимый причастный оборот в р е м е н и (чаще стоит в начале предложения).

Its boundaries having been extended, Moscow has become a city with the largest administrative area in the world.

После того как границы Москвы были расширены, она стала городом с самой большой площадью в мире.

2. Независимый причастный оборот у с л о в и я (чаще стоит в начале предложения).

Other things being equal, iron will oxidize more rapidly than mercury or silver.

При прочих равных условиях железо будет окисляться быстрее, чем ртуть или серебро.

3. Независимый причастный оборот п р и ч и н ы (стоит либо в начале предложения, либо в конце).

The weather conditions being unfavourable, the planes could not leave the aerodrome.

Так как метеорологические условия были неблагоприятными, то самолеты не могли подняться с аэродрома.

Power is the basis of civilization, all industry and transport being dependant upon power in some form.

Энергия является основой цивилизации, так как вся промышленность и транспорт зависят от энергии в том или ином виде.

4. Независимый причастный оборот с о п у т с т в у ю щ и х о б с т о я т е л ь с т в (обычно стоит в конце предложения).

Special cameras may be used to photograph the ocean bed, the photographs showing any rocks and living organisms at depths of more than three kilometers.

Для фотографирования дна океана могут быть использованы специальные камеры, причем на фотографиях видны все скалы и живые организмы на глубинах более трех километров.

П р и м е ч а н и е. Иногда перед независимым причастным оборотом причины и сопутствующих обстоятельств стоит предлог *with*, который не переводится.

The mixture of fuel and air prior to ignition is of heterogeneous nature, *with* atomization, vaporization and mixing occurring simultaneously.

Смесь топлива и воздуха перед воспламенением имеет гетерогенный характер, причем распыление, испарение и смешение происходит одновременно.

IX. ЭМФАТИЧЕСКИЕ КОНСТРУКЦИИ

Эмфатические конструкции служат для выделения того или иного члена предложения.

1. Эмфатическая конструкция *it is (has been, was)... that (which, who)* может выделять любой член предложения, кроме сказуемого. Само сочетание *it is... that* не переводится, а эмфаза достигается употреблением усилительных слов, изменением порядка слов или интонацией, и сложноподчиненное предложение переводится как простое предложение.

It is only under these conditions that satisfactory results can be achieved.

Удовлетворительные результаты могут быть получены только при этих условиях.

Вариантом эмфатической конструкции *it is... that* является эмфатическое сочетание *it was not until... that*, с помощью которого часто выделяется обстоятельство времени. Само сочетание *it was not until... that* не переводится, а перед обстоятельством времени обычно ставится «только», «и только в», «и только когда».

It was not until 1955 that this law was discovered.

Этот закон был открыт только в 1955 г.

It was not until 1955 that Burke and Franklin discovered that Jupiter is a source of radio noise storms.

И только в 1955 г. Берк и Франклин открыли, что Юпитер является источником возникновения мощных радиопомех.

П р и м е ч а н и е. Эмфатическую конструкцию *it is... that* не следует путать с безличным предложением. Если предложение сохраняет правильную структуру без *it is... that (who, which)*, то это эмфатическая конструкция. При безличном предложении целостность структуры нарушается.

It was one of the main shortcomings of the machine that all operations had to be performed simultaneously

Одним из основных недостатков этой машины было то, что все операции должны были выполняться одновременно.

2. Употребление *do* (*does, did*) для усиления стоящего после него сказуемого в утвердительной или повелительной форме. При переводе перед смысловым глаголом добавляется слово «действительно», «все же» или же *do* совсем не переводится.

It did take much time to calculate the orbit of the man-made moon.

Для расчета орбиты искусственного спутника действительно потребовалось много времени.

3. Двойное отрицание. Отрицание *not* в сочетании с отрицательной приставкой прилагательного или наречия, или же со словом, имеющим отрицательное значение, усиливает высказывание. Такие предложения переводятся утвердительной формой и перед прилагательным или наречием обычно добавляется слово «вполне», «только».

It is not unlikely, however, that this technique will be successful.

Однако вполне вероятно, что этот метод окажется успешным.

Before the advent of electronic computes it was by *no means uncommon* for the complete analysis of a single molecule to take two or three years.

До появления электронных вычислительных машин было вполне обычным, что на полный анализ одной молекулы затрачивалось два или три года.

The key to plastic deformation of crystalline materials was *not discovered until 1934.*

Причина пластических деформаций кристаллических материалов была открыта только в 1934 г.

4. Нарушение обычного порядка слов. Широко применяется для выделения второстепенных членов предложения, которое выносится на первое место:

а) После некоторых наречий и союзов (*only, not only, never, hardly, seldom, no sooner... than*) и союзных наречий (*so, neither, nor*).

Seldom does this method provide satisfactory results.

Этот метод редко дает удовлетворительные результаты.

б) Вынесение на первое место Participle I, входящего в состав формы Continuous, и Participle II и прилагательного, являющихся частью составного сказуемого. Перевод надо начинать с дополнения или обстоятельства, стоящих после выделяемого члена, а уже затем переводить сказуемое без инверсии.

Emerging from the undergrowth of westcoast African jungles are new export products — bauxite, alumina and aluminium.

Из недр джунглей, расположенных на западном побережье Африки, добываются новые продукты экспорта — бокситы, глинозем и алюминий.

Closely allied to electron microscopy are electron diffraction and x-ray microanalysis.

С электронной микроскопией тесно связаны электронная дифракция и рентгеновский микроанализ.

Included in the paper are data calculated by this scientist.

В работу включены данные, рассчитанные этим ученым.

в) Вынесение на первое место именной части сказуемого, выраженной прилагательным или наречием с последующим союзом *as, though* или предшествующим *however*. Порядок слов может быть как прямой, так и обратный. Перевод надо начинать со слов «хотя», «как ни», «какой ни».

I have to mention some figures, uncertain as some of them are.

Я должен привести ряд цифр, хотя некоторые из них и неточны.

Modern though the digital computer is the fundamental principles of its organization were set forth long before the era of electronics.

Хотя цифровая вычислительная машина и является современным устройством, основные принципы ее работы были разработаны задолго до эры электроники.

However complicated these calculations are those of chapter V are a great deal more complicated.

Как ни сложны эти расчеты, расчеты, приведенные в главе V, являются значительно более сложными.

Х. НЕПОЛНЫЕ ПРИДАТОЧНЫЕ ПРЕДЛОЖЕНИЯ

В английских предложениях часто встречаются сочетания слов, состоящие из союза обстоятельственного предложения (*if, when, while, though*) и причастия, прилагательного или предложной группы существительного. Такие сочетания слов следует рассматривать как неполные придаточные предложения и переводить на русский язык обстоятельными предложениями, причем подлежащим обстоятельного придаточного предложения становится подлежащее главного предложения, а время сказуемого согласуется со временем сказуемого главного предложения.

This construction, though useful, is not used on a wide scale.

Хотя эта конструкция и является полезной, она не находит широкого применения.

This polyatomic molecule, if present in appreciable amount, affects the character of the discharge.

Если эта полиатомная молекула присутствует в достаточном количестве, она влияет на характер разряда.

While in the openhearth furnace the charge undergoes different chemical reactions.

Когда загрузка находится в мартеновской печи, она подвергается там различным химическим реакциям.

ХІ. БЕССОЮЗНЫЕ ПРИДАТОЧНЫЕ ПРЕДЛОЖЕНИЯ

В английском языке определительные и дополнительные придаточные предложения могут присоединяться к главному без союзных слов и союзов. При переводе на русский язык такие придаточные предложения вводятся союзным словом, или же союзом.

а) Бессоюзное присоединение определительных придаточных предложений:

The cathodes we have just described are not the only ones available.

Катоды, которые мы только что описали, не единственные из имеющихся в наличии.

б) Бессоюзное присоединение дополнительных придаточных предложений:

We learned quite recently the instrument was not of the highest quality.

Совсем недавно мы установили, что этот прибор не высшего качества.

ХП. НЕКОТОРЫЕ ДРУГИЕ ТРУДНОСТИ

Парные союзы *the ... the* с прилагательным или наречием в сравнительной степени

Такие сочетания переводятся на русский язык словами «чем... тем» плюс соответствующее прилагательное или наречие в сравнительной степени.

The higher the temperature of a piece of charcoal the faster it will burn.

Чем выше температура куска древесного угля, тем быстрее он будет сгорать.

That (of)—заместитель ранее упомянутого существительного

В таких случаях местоимение *that (of)* для единственного числа и *those (of)* для множественного числа обычно переводится существительным, которое оно заменяет, или совсем не переводится.

Now the territory of Moscow is 6000 hectares larger than that of New York, almost three times that of London and eight times that of Paris.

Теперь территория Москвы на 6000 га больше территории Нью-Йорка, почти в три раза больше территории Лондона и в восемь раз больше территории Парижа.

The properties of natural rocks are to some degree comparable with those of artificial materials.

Свойства естественных пород до некоторой степени аналогичны свойствам искусственных материалов.

Некоторые функции *one*

а) *one* — неопределенно-личное местоимение в функции подлежащего или дополнения. В этом случае *one* обычно не переводится. Если в состав сказуемого входит модальный глагол, то предложение, содержащее неопределенное

местоимение *one* в функции подлежащего, переводится безличным предложением.

For small power require ments, when *one needs* merely a few kilowatts of electricity, thermoelectric generators can complete with steam engines. Their efficiency will increase significantly if *one is able* to go on to higher temperatures.

These data *enable one* to calculate final results of the experiment.

б) *one* — заместитель ранее упомянутого существительного в единственном числе (*ones* — для множественного числа). В этом случае *one* (*ones*) либо переводится существительным, которое оно заменяет, либо совсем не переводится.

The history of radar is *a long one*, for the underlying principle has been known to science for a long time.

При небольшом расходе энергии, когда *требуется* только несколько киловатт электроэнергии, термоэлектрические генераторы могут конкурировать с паровыми двигателями. Их к.п.д. существенно возрастет, если *имеется возможность* продолжать эксплуатировать их при более высоких температурах.

Эти данные *позволяют* определить окончательные результаты опыта.

История создания радара является *длинной*, так как основной принцип был известен науке уже давно.

Некоторые функции *to do*

а) Для усиления глагола, стоящего после *do* в утвердительных и повелительных предложениях.

He *did* read this article many times.

Он *действительно* читал эту статью много раз.

б) Вместо ранее упомянутого смыслового глагола. Обычно переводится тем глаголом, который он заменяет, или совсем не переводится.

Electron microscope originated about 1931 and has probably done as much for science in those 30 years as the optical microscope *did* in 300.

Электронный микроскоп был создан в 1931 году, и за эти 30 лет, он, пожалуй, внес такой же вклад в науку, как и оптический микроскоп за 300 лет.

Некоторые функции to be

«To be + инфинитив» переводится:

а) словами «заключается в том, чтобы», «состоит в том, чтобы» или совсем не переводится.

In celestial mechanics one of the basic problems is to determine orbits of planets, asteroids, comets and meteors.

В небесной механике одна из основных проблем заключается в том, чтобы определить орбиты планет, астероидов, комет и метеоров.

б) словами «должен», «должен был», «следует».

It is to be emphasized that these correlations are purely empirical in nature.

Следует подчеркнуть, что эти соотношения имеют чисто эмпирический характер.

Примечание. Употребление глагола to be + инфинитив в страдательном залоге, чаще всего с глаголами to see, to find, to gain указывает на возможность совершения действия и переводится словами «можно», «может быть».

The potentiometer which is to be found in most metallurgical laboratories is used for the accurate measurement of potential differences.

Потенциометр, который можно найти почти во всех металлургических лабораториях, используется для точного измерения разности потенциалов.

The books by L. Tolstoy are to be found in every library.

Книги Льва Толстого можно найти в любой библиотеке.

These pictures were to be seen everywhere.

Эти картины можно было увидеть всюду.

Некоторые функции to have

а) «to have + инфинитив» в качестве составного глагольного сказуемого выражает необходимость, вызванную обстоятельствами. Обычно переводится словами «должен», «должен был».

For a complete explanation of the phenomena many other processes have to be taken into account.

Для исчерпывающего объяснения этих явлений должны быть учтены многие другие процессы.

б) Оборот «to have + дополнение + инфинитив» выражает намерение или желание.

They <i>have</i> some interesting data to tell you.	Они <i>хотят</i> сообщить вам некоторые интересные данные.
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в) Оборот «to have + существительное + Participle II» показывает, что действие производится не самим подлежащим, а выполняется для него кем-то другим.

Переводится либо неопределенно-личным предложением, либо придаточным предложением, вводимым союзом «чтобы», причем существительное этого оборота становится подлежащим придаточного предложения, а инфинитив — сказуемым.

Many computers <i>have</i> special orders built in.	Во многие вычислительные машины <i>встроены</i> специальные программы.
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It would be desirable <i>to have</i> these curves drawn for different metals.	Было бы желательно, <i>чтобы</i> эти кривые были вычерчены для различных металлов.
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г) Оборот «to have + существительное + Infinitive без to» показывает, что действие производится самим существительным. Переводится придаточным предложением, вводимым союзом «чтобы», причем существительное этого оборота становится подлежащим придаточного предложения, а инфинитив — сказуемым.

It is most desirable <i>to have</i> the meter work under severe conditions.	Весьма желательно, <i>чтобы</i> этот измерительный прибор <i>работал</i> и в трудных условиях.
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Грамматические трудности при переводе английской научной литературы

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